MANATROL COLORFLOW CONTROL VALVES

PROGRESSIVE PRODUCTS FOR FLUID CONTROL

N. B. COCHRANE CO.
2828 LOCH RAVEN RD. BALTO. 18, MD.
HOpkins 7-4884

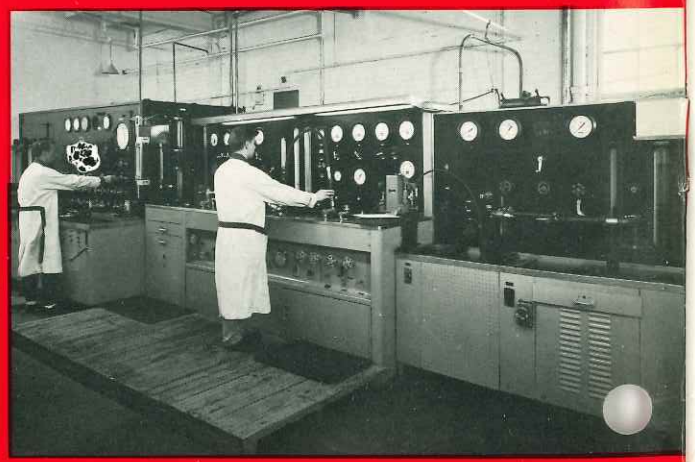
DIVISION OF PERRY-FAY CO.

MANATROL *a union of*

...engineering

....production

..... testing



FLOW CONTROL VALVES
F & FS Series 2-4

NEEDLE VALVES
N & NS Series 5-7

METERING VALVES
MV Series 8-15

BALANCED NEEDLE THROTTLING VALVES
MVBF Series 16-17

CHECK VALVES
C & CS Series 18-20

PILOT OPERATED CHECK VALVES
CP & CPS Series 21-25

LOW PRESSURE RELIEF VALVES
CR & ECR Series 26-28

HIGH PRESSURE RELIEF VALVES
RA Series 29-30

TEMPERATURE-PRESSURE COMPENSATED FLOW CONTROL VALVES
TPC & TPCS Series 31-35

TEMPERATURE-PRESSURE COMPENSATED FLOW CONTROL VALVES, WITH INTEGRAL CHECK
TPCC & TPCCS Series 36-40

ADJUSTABLE FLOW, IN-LINE, PRESSURE-COMPENSATED FLOW CONTROL VALVES
PCAF Series 41-42

FIXED-FLOW, IN-LINE, PRESSURE-COMPENSATED FLOW CONTROL VALVES
PCFF Series 43-44

PUSH TO READ VALVES
GT Series 45-46

GAUGE SNUBBERS
G & GF Series 47-50

CAM OPERATED 2-WAY, DECELERATION VALVES
D & DS Series 51-53

TRAVERSE AND FEED CYCLE CONTROL PANELS
Sample Circuit 54
Panels 55-63

DISTRIBUTORS
To Serve You 64

MANATROL

DIVISION OF THE PERRY-FAY CO.
200 PERRY COURT
ELYRIA, OHIO 44035
Phone: 322-4631

F AND FS SERIES

LINE MOUNTED FLOW CONTROL VALVE F SERIES

SUB-PLATE MOUNTED FLOW CONTROL VALVE FS SERIES*

Colorflow Flow Control Valves combine two types of valves in one compact unit while still providing the unique Manatrol Color-coding. This Manatrol Flow Control Valve allows for free flow in one direction and controlled flow in the other. The inline, integral check valve has a guided blade to prevent the poppet from cocking and uses a soft seal to assure positive sealing.

The "F" and "FS" series are available in brass, steel and 303 and 316 stainless steel, sub-plate or inline mounted, and in sizes ranging from ⅛ inch through 2 inches. All brass valves are rated at a working pressure of 2000 PSI and all steel valves at a working pressure of 5000 PSI.

HOW TO ORDER

Example: F-600-S **(This is a line mounted flow control valve with ⅜" NPTF ports made of steel)**

SERIES
F = Flow Control Valve, Line Mounted.
FS = Flow Control Valve, Sub-Plate Mounted.

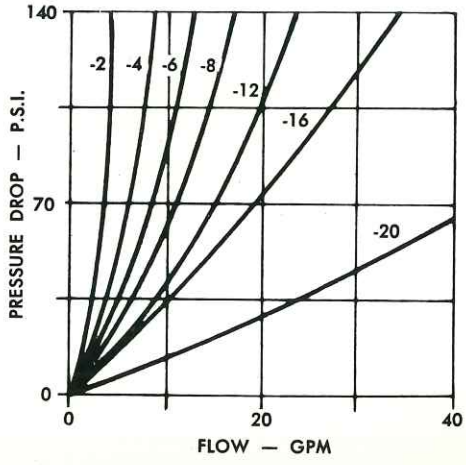
SIZE
2 = ⅛"
4 = ¼"
6 = ⅜"
8 = ½"
12 = ¾"
16 = 1"
20 = 1¼"
24 = 1½"

THREAD STYLE
00 = NPTF
10 = AND
20 = SAE

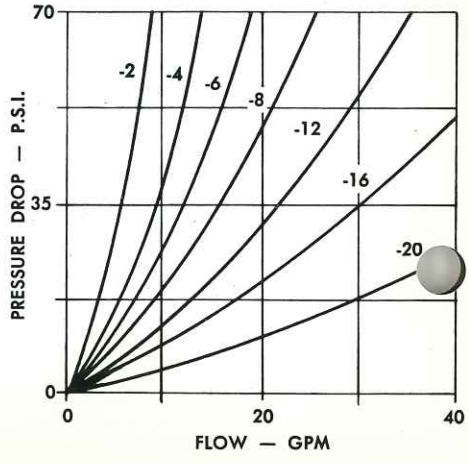
MATERIAL
B = Brass
S = Steel
SS = 303 Stainless
SS6 = 316 Stainless

Cv FACTOR	
Size	Full Open
⅛	0.36
¼	0.64
⅜	0.91
½	1.25
¾	1.96
1	4.32
1¼	7.21

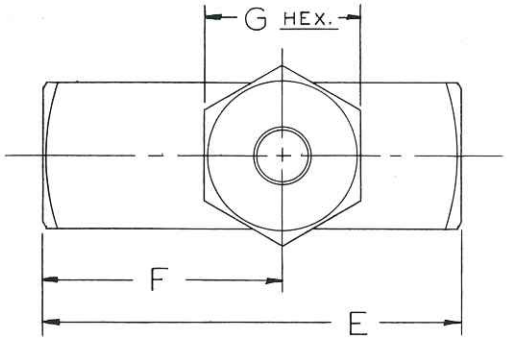
CONTROLLED FLOW

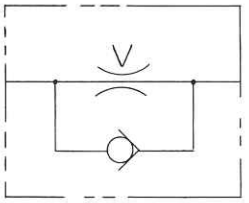


FREE FLOW



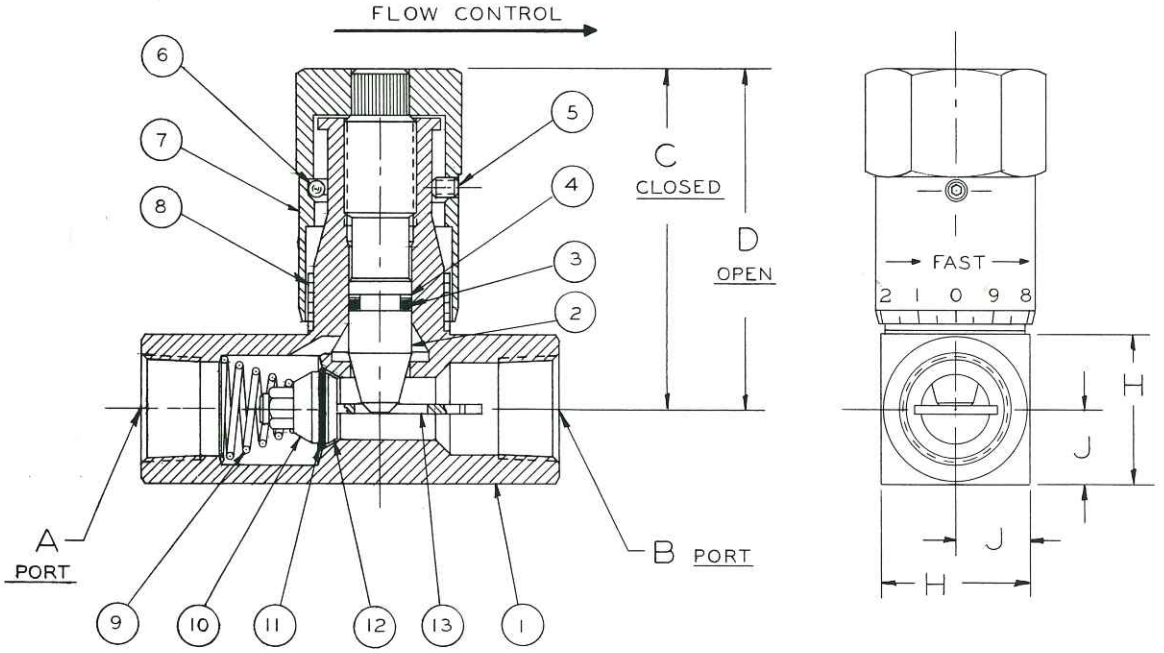
*Available in steel only.





J.I.C. SYMBOL

DIMENSION TABLE									
MOD NO.	LETTER								
	A PORT	B PORT	C	D	E	F	G	H	J
-200	1/8 NPTF	1/8 NPTF	1.39	1.54	1.75	.93	.68	.62	.31
-400	1/4 NPTF	1/4 NPTF	1.59	1.79	2.37	1.34	.75	.81	.40
-600	3/8 NPTF	3/8 NPTF	1.95	2.18	2.75	1.64	.93	1.00	.50
-800	1/2 NPTF	1/2 NPTF	2.39	2.67	3.18	1.87	1.12	1.18	.59
-1200	3/4 NPTF	3/4 NPTF	2.81	3.38	3.56	2.03	1.31	1.50	.75
-1600	1" NPTF	1" NPTF	4.21	4.87	5.00	2.85	1.87	1.75	.87
-2000	1 1/4" NPTF	1 1/4" NPTF	4.46	5.12	6.25	3.31	1.87	2.25	1.12



MATERIAL TABLE	
*	BODY MATERIAL
-S	STEEL B-1113
-SS	303 ST'N ST'L
-SS6	316 ST'N ST'L
-B	BRASS SAE-72

NOTES:
1. MATERIAL:
   O-RING AND SEAL:
   BUNA-N (STEEL & BRASS VALVE)
   VITON (ST'N STEEL VALVE)
   BACK-UP RING: TEFLON
   BODY: SEE MATERIAL TABLE
2. OTHER MATERIALS AND PORT CONNECTIONS AVAILABLE
3. ST'D CRACKING PRESSURE IN FREE FLOW DIRECTION: 1 P.S.I.
4. RECOMMENDED MAX. WORKING PRESS:
   STEEL & ST'N. ST'L VALVE: 5,000 P.S.I.
   BRASS VALVE: 2,000 P.S.I.

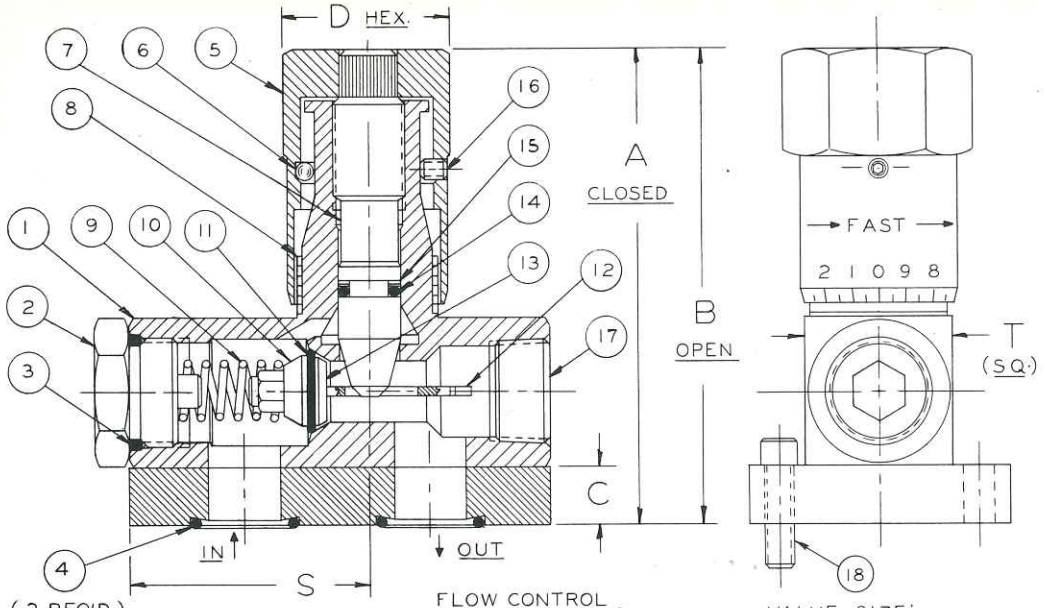
DESCRIPTION		MANATROL PART NO.						
NO.	MODEL NO. →	F-200	F-400	F-600	F-800	F-1200	F-1600	F-2000
1	BODY	13-B-66	1-B-151	4-B-133	7-B-78	10-B-136	25-B-103	22-B-31
2	NEEDLE	13-A-2	1-A-2	4-A-2	7-A-2	10-A-2	25-A-5	25-A-5
3	O-RING NEEDLE	0-004-1	0-006-1	0-008-1	0-010-1	0-011-1	0-112-1	0-112-1
4	BACK-UP RING		BU-006	BU-008	BU-010	BU-011	BU-112	BU-112
5	SET SCREW	13-A-24	13-A-24	13-A-24	7-A-26	7-A-26	25-A-11	25-A-11
6	LOCKING BALL	13-A-9	13-A-9	4-A-29	7-A-25	7-A-25	25-A-10	25-A-10
7	KNOB	13-A-5	1-A-5	4-A-5	7-A-5	10-A-5	25-A-6	25-A-6
8	MARKING WASHER	13-A-7	1-A-7	4-A-7	7-A-7	10-A-7	25-A-7	25-A-7
9	SPRING	13-A-8	1-A-8	4-A-8	7-A-8	10-A-8	25-A-16	22-A-7
10	POPPET	13-A-6	1-A-6	4-A-11	7-A-11	10-A-11	25-A-2	22-A-16
11	POPPET SEAL	13-A-25	1-A-28	4-A-31	7-A-27	10-A-25	25-A-17	22-A-21
12	POPPET RETAINER	13-A-12	1-A-10	4-A-12	7-A-12	10-A-12	25-A-13	22-A-12
13	GUIDE BLADE	13-A-3	1-A-40	4-A-129	7-A-75	10-A-133	25-A-93	22-A-55

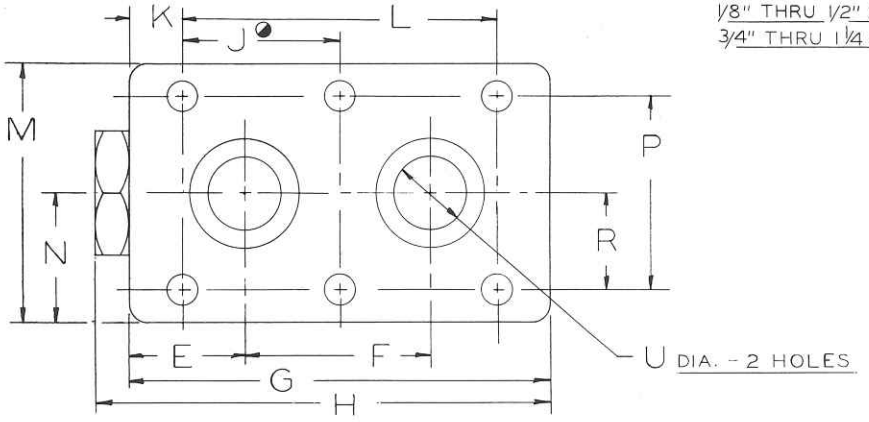
MANATROL
A DIVISION OF THE PERRY-FAY CO.
200 PERRY CT. ELYRIA, OHIO

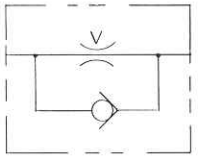
SCALE: ~~1~~ APPROVED BY E.S. 5-28-63 DRAWN BY W.W.A.
DATE: 5-28-63 REVISED

ASSEMBLY - FLOW CONTROL VALVE, SIZES: 1/8 THRU 1 1/4, NPTF PORTS

MODEL: "F" SERIES DRAWING NUMBER 203-C-2







J.I.C. SYMBOL

DIMENSION TABLE

MOD. NO.	LETTER														
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R
-200	1,88	2.03	.18	.68	.56	.62	1.75	1.98	—	.50	.75	1.62	.81	1.12	.56
-400	2.17	2.37	.18	.75	.75	1.00	2.50	2.79	—	.56	1.37	1.81	.90	1.31	.65
-600	2.63	2.86	.18	.93	.87	1.00	2.75	3.06	—	.71	1.32	2.00	1.00	1.50	.75
-800	3.34	3.62	.36	1.12	1.00	1.18	3.18	3.49	—	.84	1.50	2.25	1.12	1.75	.87
-1200	4.01	4.58	.45	1.31	.98	2.14	4.09	4.49	1.50	.54	3.00	2.87	1.43	2.12	1.06
-1600	5.75	6.41	.67	1.87	1.37	2.25	5.00	5.40	1.87	.62	3.75	3.12	1.56	2,37	1.18
-2000	6.25	6.91	.67	1.87	1.56	3.12	6.25	6.90	2.37	.75	4.75	3.87	1.93	3.00	1.50

MOD. NO.	S	T	U	RECOMMENDED MAX. FLOW GPM
-200	.93	.62	.21	1 3/4
-400	1.34	.81	.28	3
-600	1.64	1.00	.40	6
-800	1.87	1.25	.50	10
-1200	2.03	1.50	.68	20
-1600	2.85	1.75	.87	28
-2000	3.31	2.25	1.12	45

NOTES:
1. MATERIAL:
   BACK-UP RING: TEFLON
   O-RINGS AND SEAL:
   BUNA-N (STEEL VALVE)
2. OTHER MATERIALS AVAILABLE
3. ST'D CRACKING PRESSURE IN FREE FLOW DIRECTION: 5 P.S.I.
4. RECOMMENDED MAX. WORKING PRESSURE: 5,000 P.S.I.
5. ◔ "J" DIMENSION TO BE USED ONLY WITH 3/4" & UP VALVES

NO.	DESCRIPTION MODEL NO. →	MANATROL PART NO. FS-200	FS-400	FS-600	FS-800	FS-1200	FS-1600	FS-2000
1	BODY, SUB-ASS'Y	13-B-71	1-B-155	4-B-137	7-B-82	10-B-141	25-B-107	22-B-67
2	END PLUG ASS'Y	13-A-69	1-A-154	4-A-136	7-A-81	10-A-139	25-A-106	22-A-66
3	O-RING, END PLUG	00-4-2	00-6-2	00-8-2	00-10-2	00-12-2	00-16-2	00-24-2
4	O-RING, BODY	0-010-1	0-012-1	0-111-1	0-113-1	0-116-1	0-214-1	0-218-1
5	KNOB	13-A-5	1-A-5	4-A-5	7-A-5	10-A-5	25-A-6	25-A-6
6	LOCKING BALL	13-A-9	13-A-9	4-A-29	7-A-25	7-A-25	25-A-10	25-A-10
7	NEEDLE	13-A-2	1-A-2	4-A-2	7-A-2	10-A-2	25-A-5	25-A-5
8	MARKING WASHER	13-A-7	1-A-7	4-A-7	7-A-7	10-A-7	25-A-7	25-A-7
9	SPRING, POPPET	13-A-18	1-A-3	4-A-15	7-A-9	10-A-9	25-A-23	22-A-3
10	POPPET	13-A-6	1-A-6	4-A-11	7-A-11	10-A-11	25-A-2	22-A-16
11	POPPET SEAL	13-A-25	1-A-28	4-A-31	7-A-27	10-A-25	25-A-17	22-A-21
12	GUIDE BLADE	13-A-3	1-A-40	4-A-129	7-A-75	10-A-133	25-A-93	22-A-55
13	POPPET RETAINER	13-A-12	1-A-10	4-A-12	7-A-12	10-A-12	25-A-13	22-A-12
14	O-RING, NEEDLE	0-004-1	0-006-1	0-008-1	0-010-1	0-011-1	0-112-1	0-112-1
15	BACK-UP RING		BU-006	BU-008	BU-010	BU-011	BU-112	BU-112
16	SET SCREW	13-A-24	13-A-24	13-A-24	7-A-26	7-A-26	25-A-11	25-A-11
17	END PLUG	13-A-54	1-A-131	4-A-103	8-A-3	10-A-103	25-A-60	22-A-38
18	MOUNTING SCREW	1/4-20NC×5/8	1/4-20NC×5/8	1/4-20NC×5/8	1/4-20NC×7/8	5/16-18NC×1"	5/16-18NC×1 1/4	7/16-20NF×1 1/4

LET.	CHANGES	DATE
E	REDRAWN & REVISED	6-19-63

MANATROL
A DIVISION OF THE PERRY-FAY CO.
200 PERRY CT. ELYRIA, OHIO

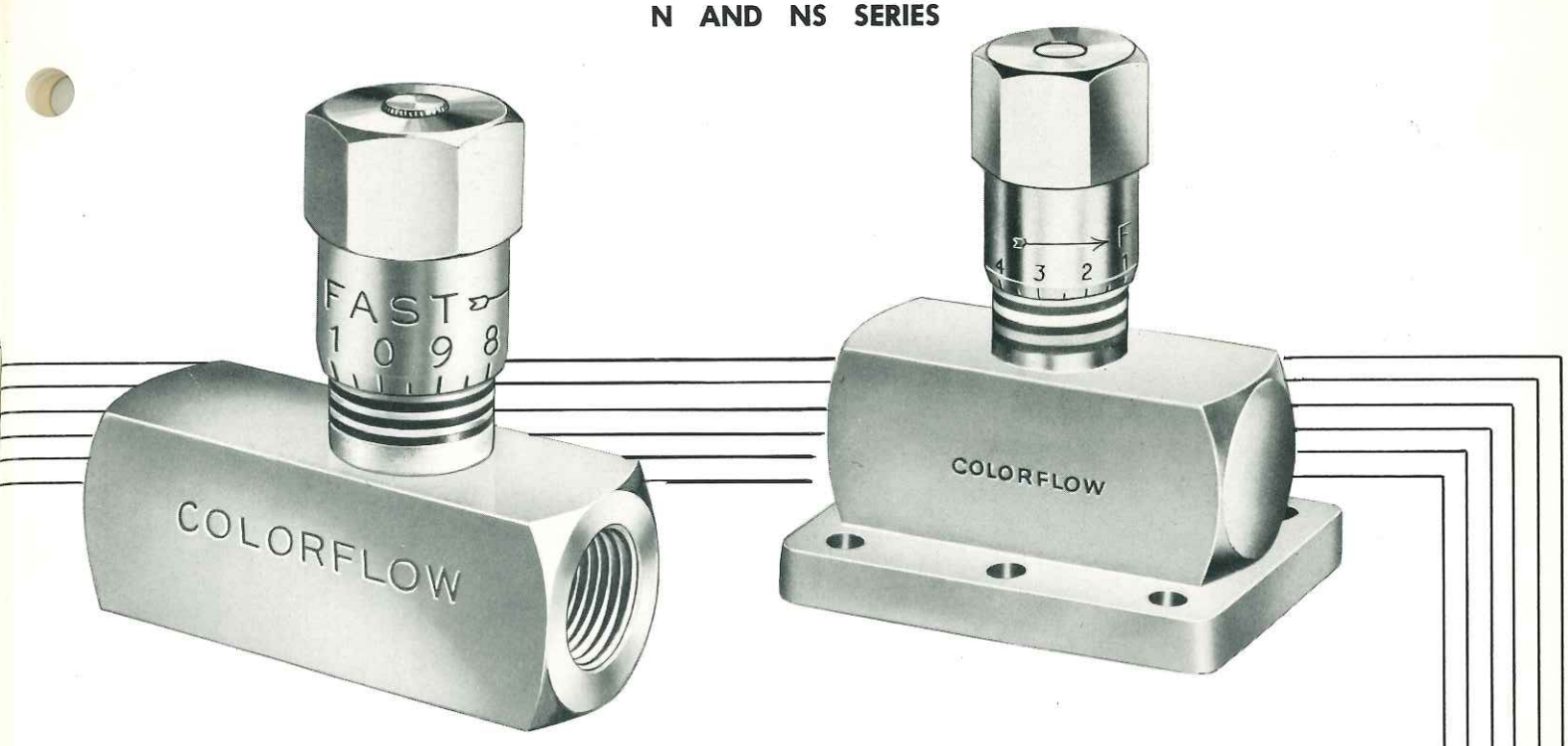
SCALE: — DATE: 6-19-63 APPROVED BY E.S. 6-9-64 DRAWN BY W.W.A. REVISED

ASS'Y - FLOW CONTROL VALVE, SUB-PLATE MTG, SIZES: 1/8 - 1 1/4

MODEL: "FS" SERIES

DRAWING NUMBER 203-C-18

N AND NS SERIES



LINE MOUNTED NEEDLE VALVE N SERIES

SUB-PLATE MOUNTED NEEDLE VALVE NS SERIES *

Colorflow Needle Valves are the easiest needle valve to set, adjust, and read yet developed. The unique, Color-coded, adjusting scale can be read at a glance by even the most inexperienced personnel. A locking set screw holds the needle securely in position so that the delicate adjustment is not disturbed by shock or vibration. An O-ring Seal with a Teflon Back-up Ring prevents any leakage and completely isolates the precision threads of the needle from the flowing fluid.

The "N" and "NS" series are available in brass, steel, 303, and 316 stainless steel and in sizes ranging from ⅛ inch through 2 inches. All brass valves are rated at a working pressure of 2000 PSI and all steel valves at a working pressure of 5000 PSI.

These features, coupled with being an in line or sub-plate mounted valve offer the designer a wide choice of sizes and variations to work with.

HOW TO ORDER

EXAMPLE: N - 800 - B (This valve is a line mounted needle valve with ½" NPTF ports made in brass.)

SERIES

N = Needle, Line Mounted
NS = Needle, Sub-Plate Mounted

SIZE

2 = ⅛"
4 = ¼"
6 = ⅜"
8 = ½"
12 = ¾"
16 = 1"
20 = 1¼"
24 = 1½"

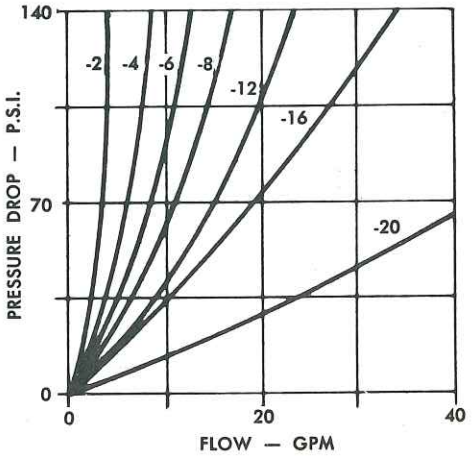
THREAD STYLE

00 = NPTF
10 = AND
20 = SAE

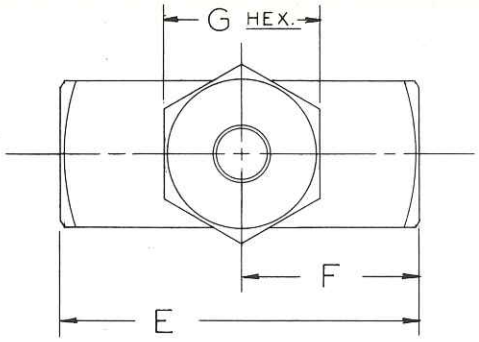
MATERIAL

B = Brass
S = Steel
SS = 303 Stainless
SS6 = 316 Stainless

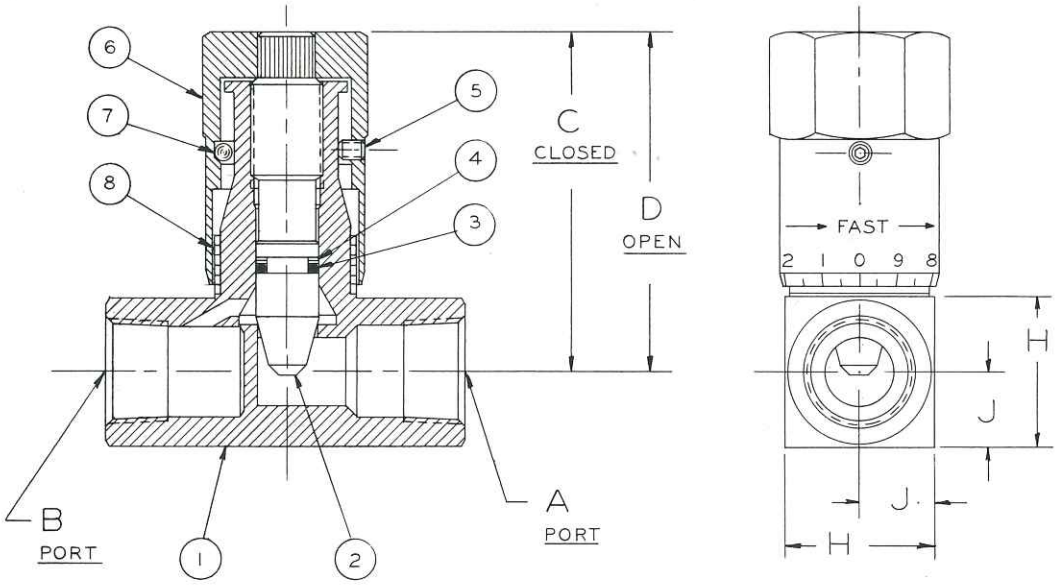
* available in steel only.

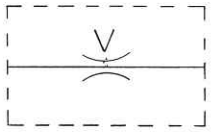


Cv FACTOR	
SIZE	FULL OPEN
⅛	0.36
¼	0.64
⅜	0.91
½	1.25
¾	1.96
1	4.32
1¼	7.21



DIMENSION TABLE									
MOD. NO.	LETTER								
	A PORT	B PORT	C	D	E	F	G	H	J
-200	1/8 NPTF	1/8 NPTF	1.39	1.54	1.50	.75	.68	.62	.31
-400	1/4 NPTF	1/4 NPTF	1.59	1.79	2.00	1.00	.75	.81	.40
-600	3/8 NPTF	3/8 NPTF	1.95	2.18	2.25	1.12	.93	1.00	.50
-800	1/2 NPTF	1/2 NPTF	2.39	2.67	2.65	1.32	1.12	1.18	.59
-1200	3/4 NPTF	3/4 NPTF	2.81	3.38	3.00	1.75	1.31	1.50	.75
-1600	1" NPTF	1" NPTF	4.21	4.87	4.25	2.12	1.87	1.75	.87





J.I.C. SYMBOL

MATERIAL TABLE	
*	BODY MATERIAL
-S	STEEL B-1113
-SS	303 ST'N ST'L
-SS6	316 ST'N ST'L
-B	BRASS SAE-72

NOTES:
1. MATERIAL:
   O-RING: BUNA-N (STEEL & BRASS VALVE)
   VITON (ST'N. STEEL VALVE)
   BACK-UP RING: TEFLON
   BODY: SEE MATERIAL TABLE
2. OTHER MATERIALS AND PORT CONNECTIONS AVAILABLE
3. RECOMMENDED MAX. WORKING PRESSURE:
   STEEL & ST'N STEEL VALVE: 5000 PSI
   BRASS VALVE: 2000 PSI

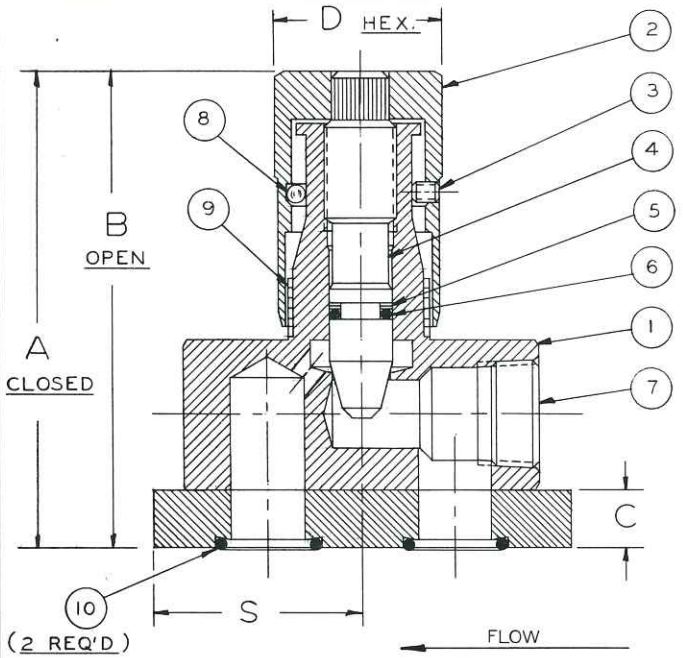
DESCRIPTION		MANATROL PART NO.					
NO.	MODEL NO. →	N-200	N-400	N-600	N-800	N-1200	N-1600
1	BODY	14-B-1	2-B-1	5-B-1	8-B-1	11-B-1	25-B-12
2	NEEDLE	13-A-2	1-A-2	4-A-2	7-A-2	10-A-2	25-A-5
3	O-RING, NEEDLE	0-004-1	0-006-1	0-008-1	0-010-1	0-011-1	0-112-1
4	BACK-UP RING		BU-006	BU-008	BU-010	BU-011	BU-112
5	SET SCREW	13-A-24	13-A-24	13-A-24	7-A-26	7-A-26	25-A-11
6	KNOB	13-A-5	1-A-5	4-A-5	7-A-5	10-A-5	25-A-6
7	LOCKING BALL	13-A-9	13-A-9	4-A-29	7-A-25	7-A-25	25-A-10
8	MARKING WASHER	13-A-7	1-A-7	4-A-7	7-A-7	10-A-7	25-A-7

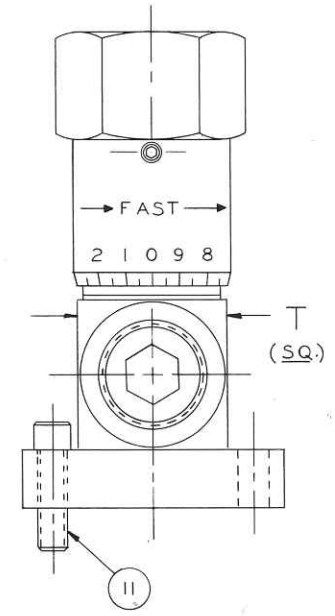
MANATROL
A DIVISION OF THE PERRY-FAY CO.
200 PERRY CT. ELYRIA, OHIO

SCALE: ++ | APPROVED BY | DRAWN BY W.W.A.
DATE: 5-27-63 | E.S. 5-27-63 | REVISED

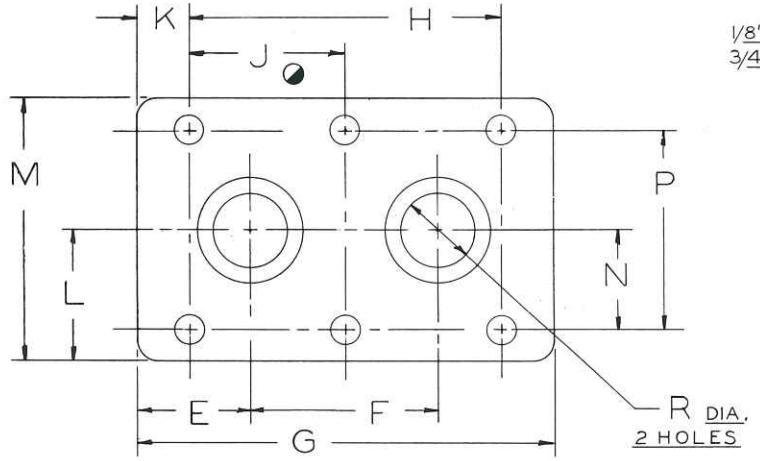
ASSEMBLY - NEEDLE VALVE, NPTF PORTS, SIZES: 1/8 THRU 1"

MODEL: "N" SERIES | DRAWING NUMBER 203-C-5





VALVE SIZE:
1/8" THRU 1/2": 4 REQ'D
3/4" & 1": 6 REQ'D



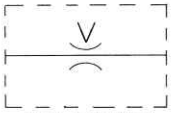
DIMENSION TABLE

MOD. NO.	LETTER A	B	C	D	E	F	G	H	J	K	L	M	N
-200	1.88	2.03	.18	.68	.56	.62	1.75	.75	—	.50	.81	1.62	.56
-400	2.17	2.37	.18	.75	.75	1.00	2.50	1.37	—	.56	.90	1.81	.65
-600	2.63	2.86	.18	.93	.87	1.00	2.75	1.32	—	.71	1.00	2.00	.75
-800	3.34	3.62	.36	1.12	1.00	1.18	3.18	1.50	—	.84	1.12	2.25	.87
-1200	4.01	4.58	.45	1.31	.98	2.14	4.09	3.00	1.50	.54	1.43	2.87	1.06
-1600	5.75	6.41	.67	1.87	1.37	2.25	5.00	3.75	1.87	.62	1.56	3.12	1.18

MOD. NO.	P	R	S	T	RECOMMENDED MAX. FLOW GPM
-200	1.12	.21	.93	.62	1 3/4
-400	1.31	.28	1.34	.81	3
-600	1.50	.40	1.64	1.00	6
-800	1.75	.50	1.87	1.25	10
-1200	2.12	.68	2.03	1.50	20
-1600	2.37	.87	2.85	1.75	28

NOTES:
1. MATERIAL:
   O-RINGS: BUNA-N (STEEL VALVE)
   VITON (ST'N. ST'L VALVE)
   BACK-UP RING: TEFLON
   BODY: SEE MATERIAL TABLE
2. OTHER MATERIALS AVAILABLE
3. RECOMMENDED MAX. WORKING PRESSURE 5000 P.S.I.
4. ◐ "J" DIMENSION TO BE USED ONLY WITH 3/4" & 1" VALVES

NO.	DESCRIPTION MODEL NO. →	MANATROL PART NO. NS-200	NS-400	NS-600	NS-800	NS-1200	NS-1600
1	BODY, SUB-ASS'Y	14-B-6	2-B-15	5-B-6	8-B-8	11-B-7	25-B-108
2	KNOB	13-A-5	1-A-5	4-A-5	7-A-5	10-A-5	25-A-6
3	SET SCREW	13-A-24	13-A-24	13-A-24	7-A-26	7-A-26	25-A-11
4	NEEDLE	13-A-2	1-A-2	4-A-2	7-A-2	10-A-2	25-A-5
5	BACK-UP RING		BU-006	BU-008	BU-010	BU-011	BU-112
6	O-RING, NEEDLE	O-004-1	O-006-1	O-008-1	O-010-1	O-011-1	O-112-1
7	END PLUG	13-A-54	1-A-131	4-A-103	8-A-3	10-A-103	25-A-60
8	LOCKING BALL	13-A-9	13-A-9	4-A-29	7-A-25	7-A-25	25-A-10
9	MARKING WASHER	13-A-7	1-A-7	4-A-7	7-A-7	10-A-7	25-A-7
10	O-RING, BODY	O-010-1	O-012-1	O-111-1	O-113-1	O-116-1	O-214-1
11	MOUNTING SCREW	1/4-20NC×5/8	1/4-20NC×5/8	1/4-20NC×5/8	1/4-20NC×7/8	5/16-18NC×1"	5/16-18NC×1 1/4



J.I.C. SYMBOL

LET.	CHANGES	DATE
G	REDRAWN & REVISED	7-17-63

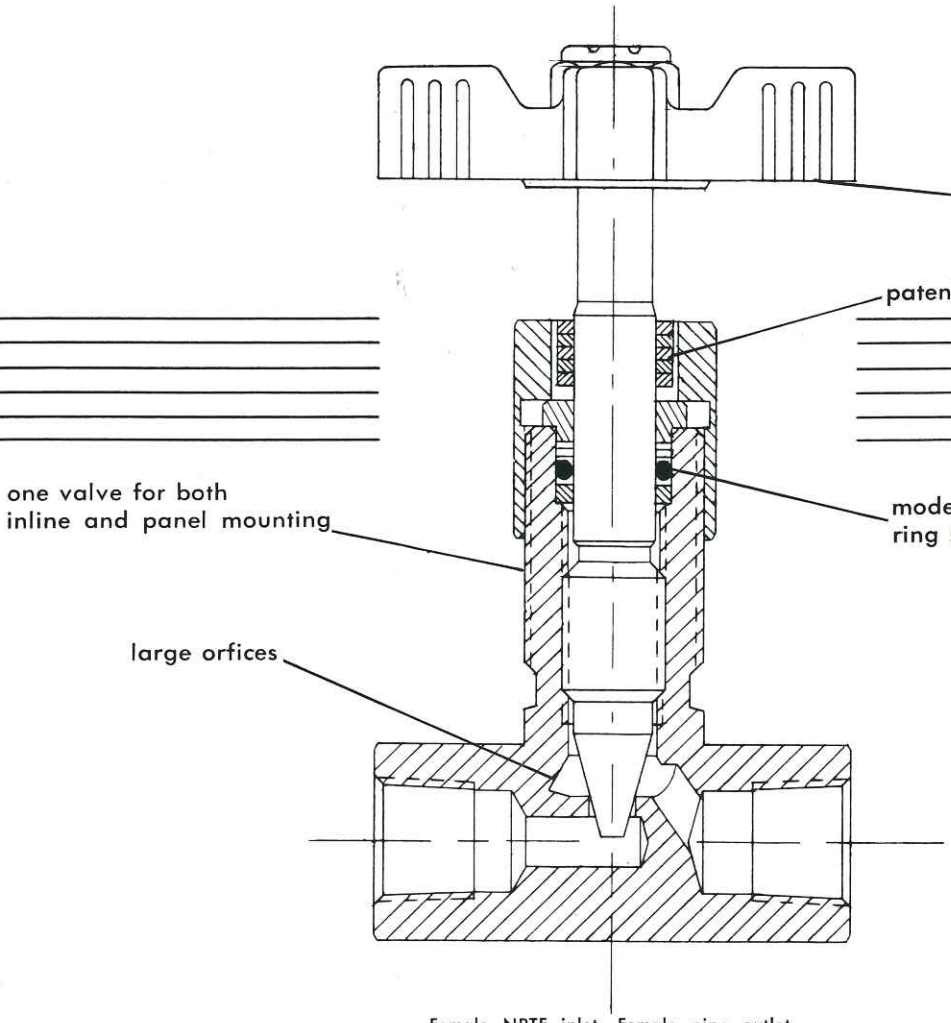
MANATROL
A DIVISION OF THE PERRY-FAY CO.
200 PERRY CT. ELYRIA, OHIO

SCALE: 1/1 | APPROVED BY E.S. 6-8-64 | DRAWN BY W.W.A.
DATE: 7-17-63 | REVISED

ASS'Y — NEEDLE VALVE, SUB-PLATE MTG, SIZES: 1/8 THRU 1"

MODEL: "NS" SERIES | DRAWING NUMBER 203-C-20

MV SERIES



Female NPTF inlet, Female pipe outlet

MODEL *00

Male NPTF inlet, Female NPTF outlet

MODEL *60

MS33656 inlet, MS33656 outlet

MODEL *30

Female NPTF inlet, Female NPTF outlet

MODEL *61

Male NPTF inlet, Female NPTF outlet

MODEL *01

Male NPTF inlet, MS33656 outlet

MODEL *65

The new Manatrol Metering Valve Series has been designed with the user in mind. The MV Series is available in steel, brass, and 316 stainless; in sizes from 1/8 inch, through 3/4 inch, and in various body configurations. All MV valves feature the unique Color Coded Calibration Scale which simplifies setting, adjusting, and recording.

Panel mounting can be accomplished at **ANY** time on **ANY** MV valves by the addition of the optional panel mounting kit.

In the 1/8 and 1/4 inch sizes, three needles are available permitting the user to precisely select the orifice range required for optimum response and control.

HOW TO ORDER

MV - 460 - S - 2

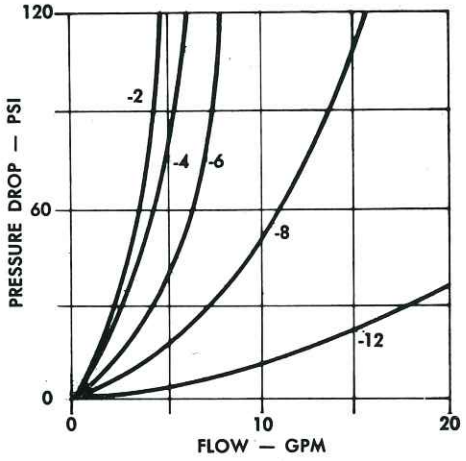
SERIES
Metering Valve

SIZE
1/8" = 2
1/4" = 4
3/8" = 6
1/2" = 8
3/4" = 12

STYLE

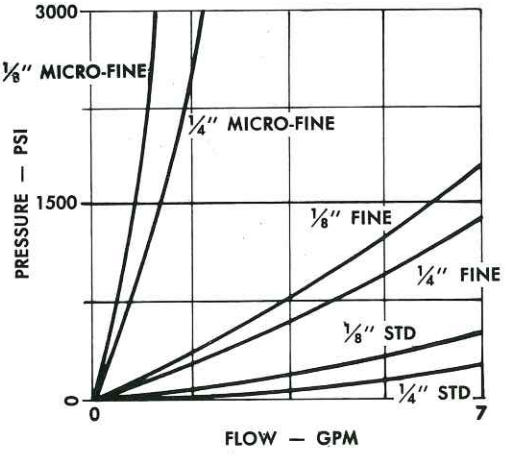
NEEDLE
Blank = Standard
-2 = Fine
-3 = Micro-Fine
(1/8" and 1/4" only)

MATERIAL
S = Steel
B = Brass
SS6 = 316 Stainless Steel



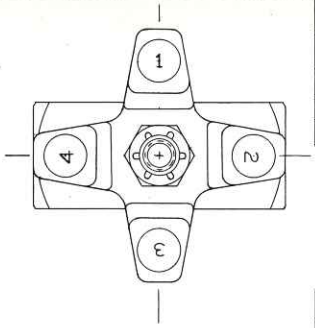
INLINE
00 = NPTF Internal Thread, both Ports
01 = NPTF External Thread to NPTF Internal Thread
30 = MS 33656 (-4 through -12 only) both Ports -37° Flare

ANGLE
60 = NPTF External Thread to NPTF Internal Thread
61 = NPTF Internal Thread both Ports
65 = NPTF External Thread to MS 33656 (-4 through -12)



Cv FACTOR			
Size	Std. Needle	Fine Needle	Micro-Fine Needle
1/8	0.36	0.072	0.001
1/4	0.64	0.124	0.017
3/8	0.91		
1/2	1.25		
3/4	1.96		

J.I.C. SYMBOL



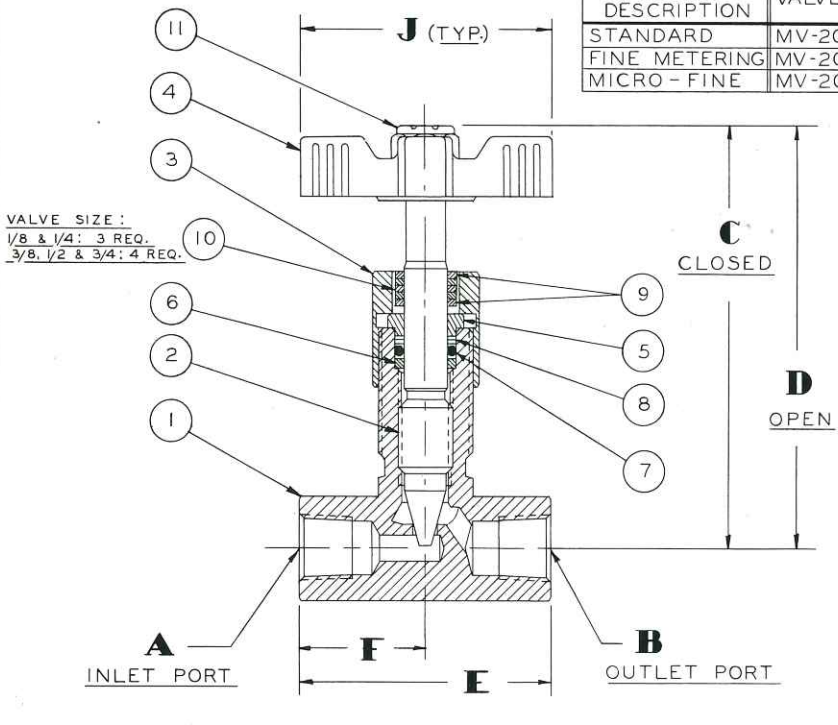
MATERIAL TABLE	
⊕	BODY MATERIAL
-S	STEEL
-B	BRASS
-SS6	316 ST'N. ST'L

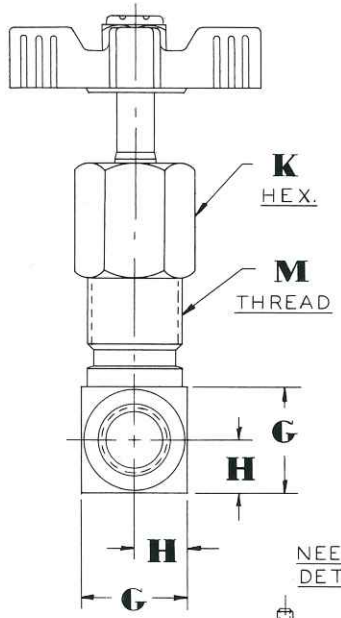
DIMENSION TABLE

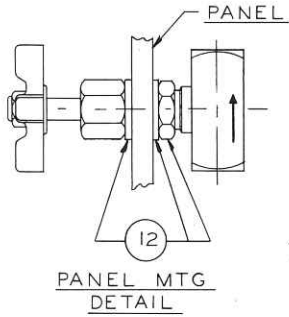
MODEL NO.	LETTER											
	A PORT	B PORT	C	D	E	F	G	H	J	K	L	M
-200	1/8 NPTF	1/8 NPTF	2.51	2.71	1.50	.75	.62	.31	1.50	.62	.59	9/16-18
-400	1/4 NPTF	1/4 NPTF	3.20	3.40	2.00	1.00	.81	.40	2.00	.87	.78	3/4 -20
-600	3/8 NPTF	3/8 NPTF	3.92	4.21	2.50	1.25	1.00	.50	2.50	1.00	.90	7/8 -20
-800	1/2 NPTF	1/2 NPTF	4.59	5.09	2.62	1.31	1.25	.62	3.00	1.25	1.15	1 1/8 - 18
-1200	3/4 NPTF	3/4 NPTF	5.03	5.57	3.25	1.62	1.50	.75	4.00	1.62	1.40	1 3/8 -12

CHART "A"

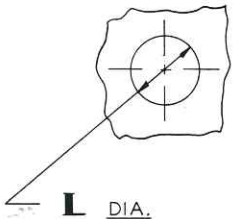
NEEDLE DESCRIPTION	VALVE Nº	NEEDLE PART Nº	VALVE Nº	NEEDLE PART Nº
STANDARD	MV-200	14-B-16	MV-400	2-A-18
FINE METERING	MV-200-2	14-B-22	MV-400-2	2-B-30
MICRO-FINE	MV-200-3	14-B-23	MV-400-3	2-B-31



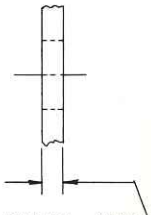




PANEL MTG DETAIL



L DIA. HOLE FOR PANEL MTG.



PANEL NOT TO EXCEED 1/4" THICK

INSTRUCTION FOR ORDERING VALVES
(USE SAMPLE MODEL NO. AS SHOWN)

MV - 400 - ✳ - ⊕

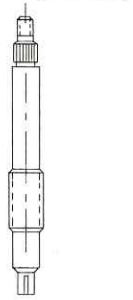
- MODEL DESIGNATION
- STYLE NO.
- MATERIAL DESIGNATION (SEE MAT'L TABLE)
- NEEDLE DESIGNATION
  - STANDARD
  - -2 FINE
  - -3 MICRO-FINE

NOTES:

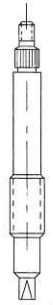
1. MATERIAL:
   - O-RING: BUNA-N (STEEL & BRASS VALVE)
     VITON (STAINLESS STEEL VALVE)
   - BACK-UP RING: TEFLON OR NYLON
   - BODY: SEE MATERIAL TABLE
2. OTHER MATERIALS AVAILABLE
3. RECOMMENDED MAX. WORKING PRESSURE:
   STEEL & ST'N. STEEL VALVE: 10 000 PSI
   BRASS VALVE: 2000 PSI
4. PANEL MOUNTING KIT AVAILABLE FOR ALL SIZE VALVES. SPECIFY WHEN ORDERING (SEE PART NO. (12).)
5. SPECIAL NEEDLES IN 1/8 AND 1/4 VALVES FOR MICRO-FINE AND FINE METERING AVAILABLE. SPECIFY WHEN ORDERING (SEE CHART "A" AND NEEDLE DETAIL)

NO.	DESCRIPTION MODEL NO. →	MANATROL PART NO. MV-200	MV-400	MV-600	MV-800	MV-1200
1	BODY	14-B-26	2-B-32	5-B-21	8-B-24	11-B-21
2	NEEDLE (STANDARD)	14-B-16	2-A-18	5-A-13	8-B-17	11-B-15
3	BONNET	14-A-11	2-A-19	5-A-9	8-A-12	11-A-10
4	HANDLE	14-B-8	2-B-20	5-A-18	8-B-22	11-B-20
5	FOLLOWER, O-RING	14-A-12	2-A-28	5-A-17	8-A-13	11-A-13
6	WASHER, O-RING	14-A-13	2-A-23	5-A-12	8-A-14	11-A-14
7	O-RING	O-010-1	O-011-1	O-012-1	O-111-1	O-112-1
8	BACK-UP RING	400-A-4-1	400-A-4-2	400-A-4-3	400-A-4-4	400-A-4-5
9	MARKING WASHER	14-A-15	2-A-21	5-A-11	8-A-16	11-A-12
10	MARKING WASHER	14-A-14	2-A-22	5-A-10	8-A-15	11-A-11
11	NUT, SELF-LOCKING	14-A-27	14-A-27	5-A-22	8-A-25	8-A-25
12	MOUNTING KIT	MVK-2	MVK-4	MVK-6	MVK-8	MVK-12

NEEDLE DETAIL



NEEDLE-3 MICRO-FINE METERING



NEEDLE-2 FINE METERING

SEE CHART "A" AND NOTE #5

MANATROL
A DIVISION OF THE PERRY-FAY CO.
200 PERRY CT. ELYRIA, OHIO

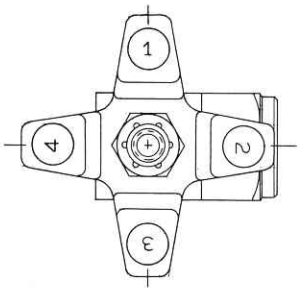
SCALE: —
DATE: 3-12-64
APPROVED BY T.Z 4-24-64
DRAWN BY W.W.A.
REVISED

ASS'Y - METERING VALVE, INTERNAL NPTF PORTS, IN-LINE, (SIZES: 1/8 - 3/4)

MODEL: MV SERIES

DRAWING NUMBER 203-C-181

J.I.C. SYMBOL



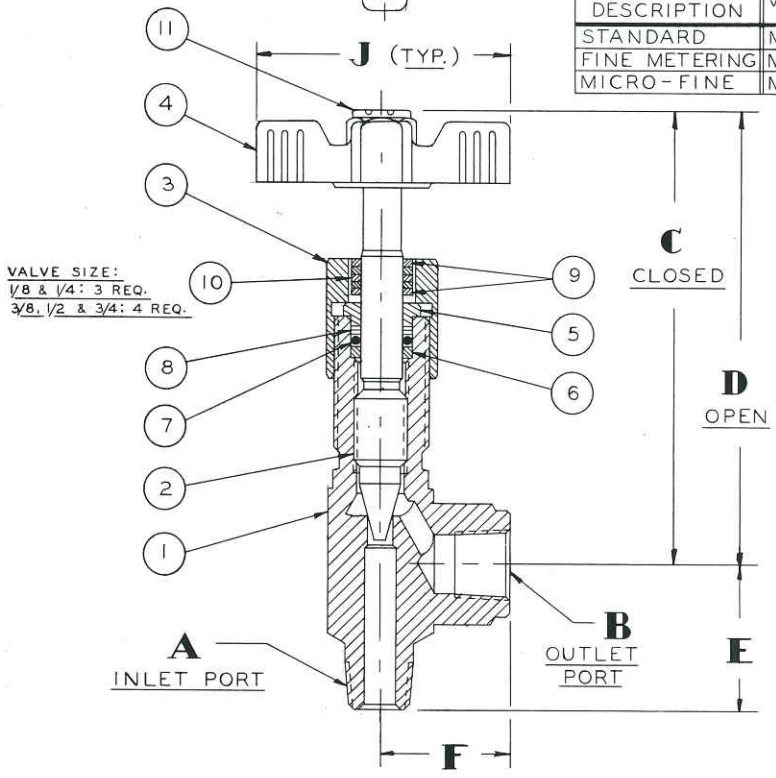
MATERIAL TABLE	
✠	BODY MATERIAL
-S	STEEL
-B	BRASS
-SS6	316 ST'N. ST'L

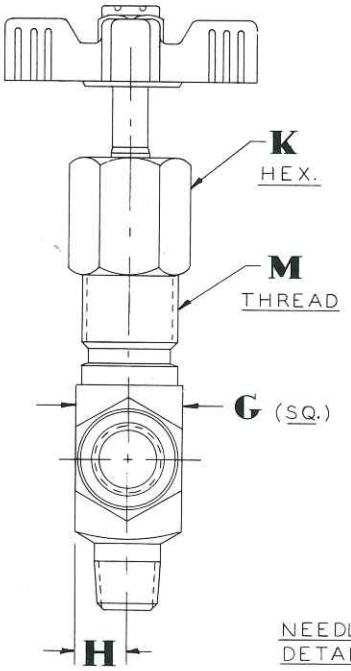
DIMENSION TABLE

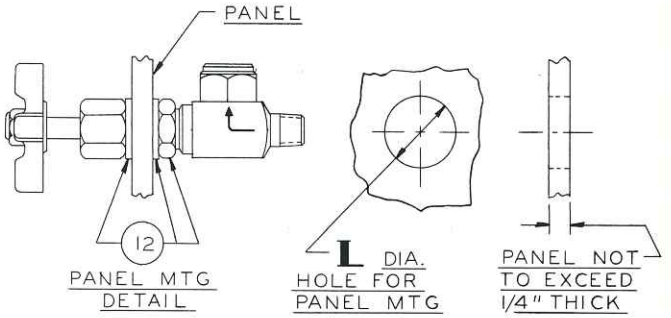
MODEL NO.	LETTER A PORT	B PORT	C	D	E	F	G	H	J	K	L	M
-260	1/8 NPTF	1/8 NPTF	2.51	2.71	.87	.75	.62	.31	1.50	.62	.59	9/16 - 18
-460	1/4 NPTF	1/4 NPTF	3.20	3.40	1.21	1.07	.81	.40	2.00	.87	.78	3/4 - 20
-660	3/8 NPTF	3/8 NPTF	3.92	4.21	1.37	1.25	1.00	.50	2.50	1.00	.90	7/8 - 20
-860	1/2 NPTF	1/2 NPTF	4.59	5.09	1.68	1.45	1.25	.62	3.00	1.25	1.15	11/8 - 18
-1260	3/4 NPTF	3/4 NPTF	5.03	5.57	1.87	1.75	1.50	.75	4.00	1.62	1.40	13/8 - 12

CHART Ⓐ

NEEDLE DESCRIPTION	VALVE Nº	NEEDLE PART Nº	VALVE Nº	NEEDLE PART Nº
STANDARD	MV-260	14-B-16	MV-460	2-A-18
FINE METERING	MV-260-2	14-B-22	MV-460-2	2-B-30
MICRO-FINE	MV-260-3	14-B-23	MV-460-3	2-B-31







INSTRUCTION FO ORDERING VALVES
(USE SAMPLE MODEL NO. AS SHOWN)

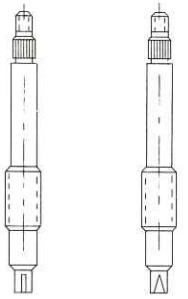
MV - 460 - ✳ - ✠

- MV: MODEL DESIGNATION
- 460: STYLE NO.
- ✳: NEEDLE DESIGNATION — STANDARD; -2 FINE; -3 MICRO-FINE
- ✠: MATERIAL DESIGNATION (SEE MAT'L TABLE)

NOTES:

1. MATERIAL:
   - O-RING: BUNA-N (STEEL & BRASS VALVE)
     VITON (STAINLESS STEEL VALVE)
   - BACK-UP RING: TEFLON OR NYLON
   - BODY: SEE MATERIAL TABLE
2. OTHER MATERIAL AVAILABLE
3. RECOMMENDED MAX. WORKING PRESSURE:
   - STEEL & STAINLESS STEEL VALVE: 10 000 PSI
   - BRASS VALVE: 2000 PSI
4. PANEL MOUNTING KIT AVAILABLE FOR ALL SIZE VALVES. SPECIFY WHEN ORDERING (SEE PART NO. ⑫)
5. SPECIAL NEEDLES IN 1/8 AND 1/4 VALVES FOR MICRO-FINE AND FINE METERING AVAILABLE. SPECIFY WHEN ORDERING (SEE CHART "Ⓐ" AND NEEDLE DETAIL)

NEEDLE DETAIL



NEEDLE -2 FINE METERING

NEEDLE -3 MICRO-FINE METERING

SEE CHART "Ⓐ" AND NOTE #5

NO.	DESCRIPTION: MODEL NO. →	MANATROL PART NO. MV-260	MV-460	MV-660	MV-860	MV-1260
1	BODY	14-B-30	2-B-36	5-B-25	8-B-30	11-B-24
2	NEEDLE (STANDARD)	14-B-16	2-A-18	5-A-13	8-B-17	11-B-15
3	BONNET	14-A-11	2-A-19	5-A-9	8-A-12	11-A-10
4	HANDLE	14-B-8	2-B-20	5-A-18	8-B-22	11-B-20
5	FOLLOWER, O-RING	14-A-12	2-A-28	5-A-17	8-A-13	11-A-13
6	WASHER, O-RING	14-A-13	2-A-23	5-A-12	8-A-14	11-A-14
7	O-RING	O-010-1	O-011-1	O-012-1	O-111-1	O-112-1
8	BACK-UP RING	400-A-4-1	400-A-4-2	400-A-4-3	400-A-4-4	400-A-4-5
9	MARKING WASHER	14-A-15	2-A-21	5-A-11	8-A-16	11-A-12
10	MARKING WASHER	14-A-14	2-A-22	5-A-10	8-A-15	11-A-11
11	NUT, SELF LOCKING	14-A-27	14-A-27	5-A-22	8-A-25	8-A-25
12	MOUNTING KIT	MVK-2	MVK-4	MVK-6	MVK-8	MVK-12

MANATROL
A DIVISION OF THE PERRY-FAY CO.
200 PERRY CT. ELYRIA, OHIO

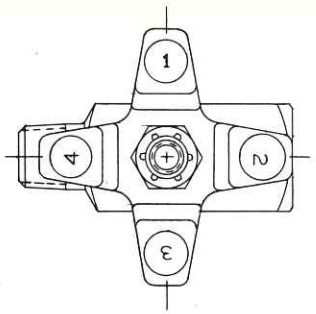
SCALE: #
DATE: 4-2-64
APPROVED BY T. Z 4-24-64
DRAWN BY W.W.A.
REVISED

ASS'Y - METERING VALVE, EXT. NPTF TO INT. NPTF, ANGLE, (SIZES: 1/8 - 3/4)

MODEL: MV SERIES

DRAWING NUMBER 203-C-204

J.I.C. SYMBOL



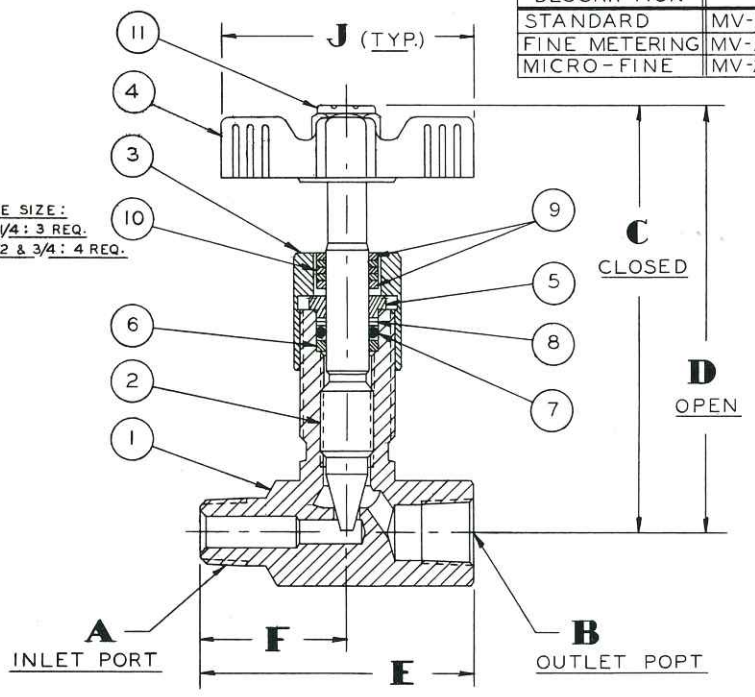
MATERIAL TABLE	
✠	BODY MATERIAL
-S	STEEL
-B	BRASS
-SS6	316 ST'N. ST'L

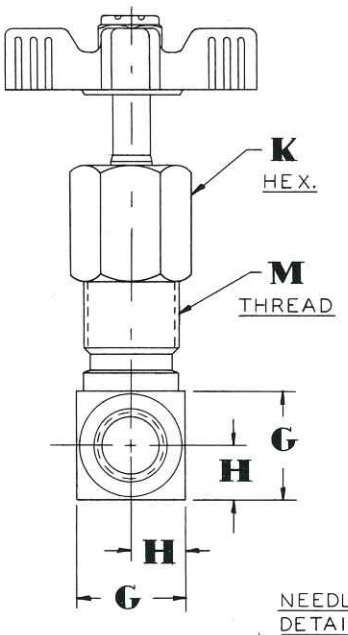
DIMENSION TABLE

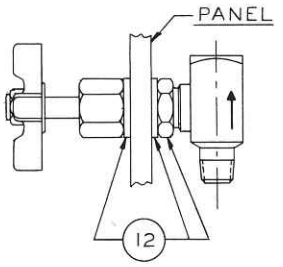
MODEL NO.	LETTER											
	A PORT	B PORT	C	D	E	F	G	H	J	K	L	M
-201	1/8 NPTF	1/8 NPTF	2.51	2.71	1.62	.87	.62	.31	1.50	.62	.59	9/16-18
-401	1/4 NPTF	1/4 NPTF	3.20	3.40	2.18	1.18	.81	.40	2.00	.87	.78	3/4-20
-601	3/8 NPTF	3/8 NPTF	3.92	4.21	2.68	1.43	1.00	.50	2.50	1.00	.90	7/8-20
-801	1/2 NPTF	1/2 NPTF	4.59	5.09	3.15	1.84	1.25	.62	3.00	1.25	1.15	1 1/8-18
-1201	3/4 NPTF	3/4 NPTF	5.03	5.57	3.62	2.00	1.50	.75	4.00	1.62	1.40	1 3/8-12

CHART A

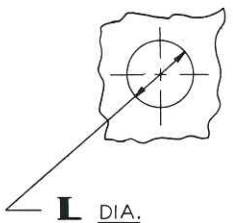
NEEDLE DESCRIPTION	VALVE Nº	NEEDLE PART Nº	VALVE Nº	NEEDLE PART Nº
STANDARD	MV-201	14-B-16	MV-401	2-A-18
FINE METERING	MV-201-2	14-B-22	MV-401-2	2-B-30
MICRO-FINE	MV-201-3	14-B-23	MV-401 3	2-B-31



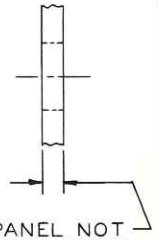




PANEL MTG DETAIL



L DIA. HOLE FOR PANEL MTG



PANEL NOT TO EXCEED 1/4" THICK

INSTRUCTION FOR ORDERING VALVES
(USE SAMPLE MODEL NO. AS SHOWN)

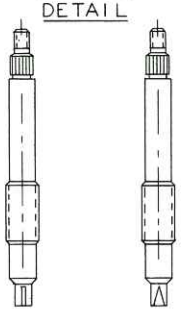
MV - 401 - ✳ - ✠

- MODEL DESIGNATION
- STYLE NO.
- NEEDLE DESIGNATION: STANDARD, -2 FINE, -3 MICRO-FINE
- MATERIAL DESIGNATION (SEE MAT'L TABLE)

NOTES:
1. MATERIAL:
   - O-RING: BUNA-N (STEEL & BRASS VALVE)
     VITON (STAINLESS STEEL VALVE)
   - BACK-UP RING: TEFLON OR NYLON
   - BODY: SEE MATERIAL TABLE
2. OTHER MATERIALS AVAILABLE
3. RECOMMENDED MAX. WORKING PRESSURE:
   - STEEL & ST'N. STEEL VALVE: 10 000 PSI
   - BRASS VALVE: 2000 PSI
4. PANEL MOUNTING KIT AVAILABLE FOR ALL SIZE VALVES. SPECIFY WHEN ORDERING (SEE PART NO. ⑫)
5. SPECIAL NEEDLES IN 1/8 AND 1/4 VALVES FOR MICRO-FINE AND FINE METERING AVAILABLE. SPECIFY WHEN ORDERING (SEE CHART "A" AND NEEDLE DETAIL)

NO.	DESCRIPTION / MODEL NO. →	MANATROL PART NO. MV-201	MV-401	MV-601	MV-801	MV-1201
1	BODY	14-B-28	2-B-33	5-B-23	8-B-26	11-B-22
2	NEEDLE (STANDARD)	14-B-16	2-A-18	5-A-13	8-B-17	11-B-15
3	BONNET	14-A-11	2-A-19	5-A-9	8-A-12	11-A-10
4	HANDLE	14-B-8	2-B-20	5-A-18	8-B-22	11-B-20
5	FOLLOWER, O-RING	14-A-12	2-A-28	5-A-17	8-A-13	11-A-13
6	WASHER, O-RING	14-A-13	2-A-23	5-A-12	8-A-14	11-A-14
7	O-RING	O-010-1	O-011-1	O-012-1	O-111-1	O-112-1
8	BACK-UP RING	400-A-4-1	400-A-4-2	400-A-4-3	400-A-4-4	400-A-4-5
9	MARKING WASHER	14-A-15	2-A-21	5-A-11	8-A-16	11-A-12
10	MARKING WASHER	14-A-14	2-A-22	5-A-10	8-A-15	11-A-11
11	NUT, SELF-LOCKING	14-A-27	14-A-27	5-A-22	8-A-25	8-A-25
12	MOUNTING KIT	MVK-2	MVK-4	MVK-6	MVK-8	MVK-12

NEEDLE DETAIL



NEEDLE-3 MICRO-FINE METERING

NEEDLE-2 FINE METERING

SEE CHART "A" AND NOTE NO. 5

MANATROL
A DIVISION OF THE PERRY-FAY CO.
200 PERRY CT. ELYRIA, OHIO

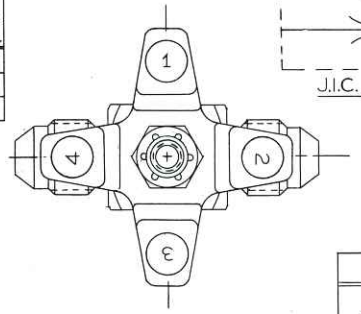
SCALE: #
DATE: 3-18-64
APPROVED BY T.Z 4-24-64
DRAWN BY W.W.A.
REVISED

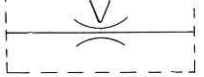
ASS'Y-METERING VALVE, EXT. NPTF TO INT. NPTF, IN-LINE, (SIZES: 1/8-3/4)

MODEL: MV SERIES

DRAWING NUMBER 203-C-188

MATERIAL TABLE	
⊕	BODY MATERIAL
-S	STEEL
-B	BRASS
-SS6	316 ST'N. ST'L





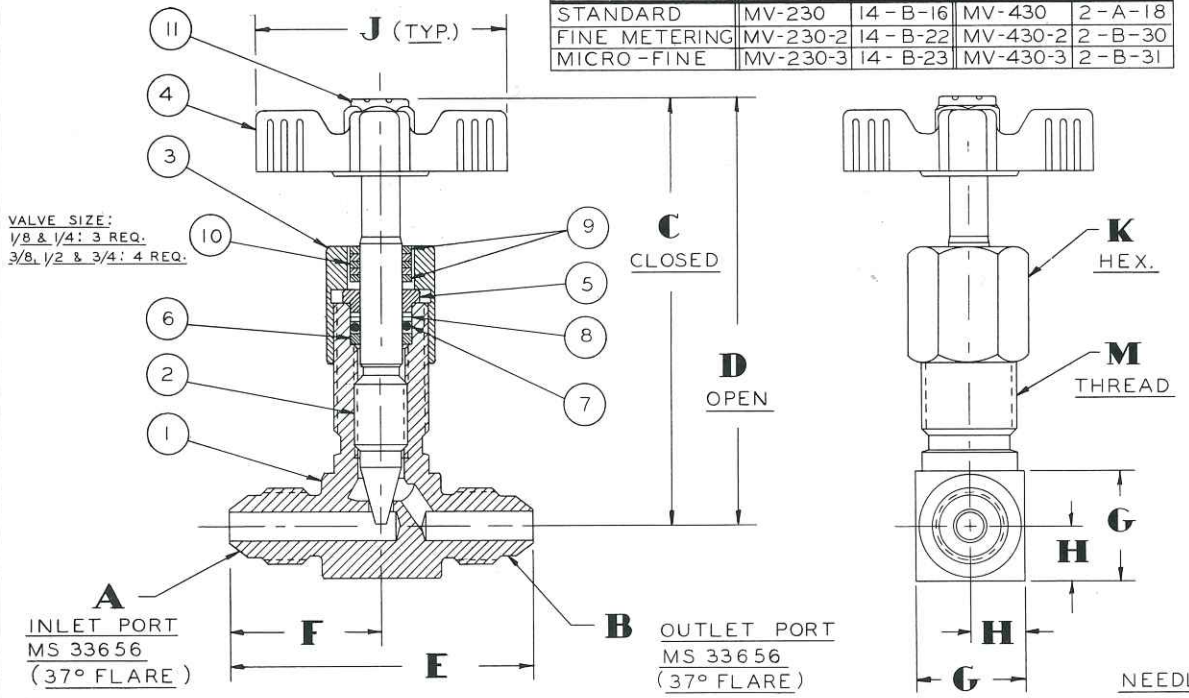
J.I.C. SYMBOL

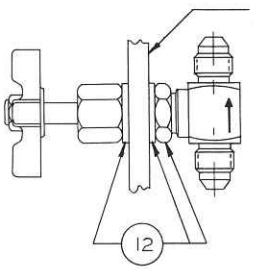
DIMENSION TABLE

MOD. NO.	LETTER TUBE O.D.	A AND B PORTS	C	D	E	F	G	H	J	K	L	M
-230	1/4	MS 33656-4 (7/16-20 UNF-3A)	2.51	2.71	1.81	.90	.62	.31	1.50	.62	.59	9/16-18
-430	3/8	MS 33656-6 (9/16-18 UNF-3A)	3.20	3.40	2.00	1.00	.81	.40	2.00	.87	.78	3/4-20
-630	1/2	MS 33656-8 (3/4 -16 UNF-3A)	3.92	4.21	2.50	1.25	1.00	.50	2.50	1.00	.90	7/8-20
-830	5/8	MS 33656-10 (7/8 -14 UNF-3A)	4.59	5.09	2.93	1.46	1.25	.62	3.00	1.25	1.15	1 1/8-18
-1230	3/4	MS 33656-12 (1 1/16-12 UN -3A)	5.03	5.57	3.50	1.75	1.50	.75	4.00	1.62	1.40	1 3/8-12

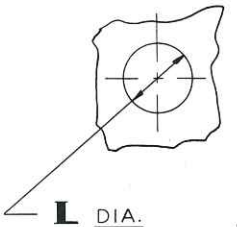
CHART Ⓐ

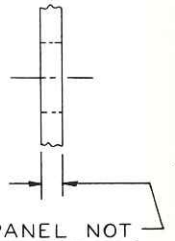
NEEDLE DESCRIPTION	VALVE Nº	NEEDLE PART Nº	VALVE Nº	NEEDLE PART Nº
STANDARD	MV-230	14-B-16	MV-430	2-A-18
FINE METERING	MV-230-2	14-B-22	MV-430-2	2-B-30
MICRO-FINE	MV-230-3	14-B-23	MV-430-3	2-B-31





PANEL MTG DETAIL





INSTRUCTION FOR ORDERING VALVES
(USE SAMPLE MODEL NO. AS SHOWN)

MV - 430 - ✳ - ⊕

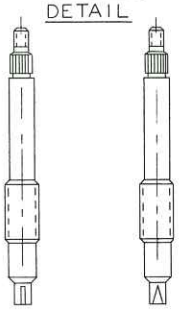
- MODEL DESIGNATION
- STYLE NO.
- NEEDLE DESIGNATION: STANDARD; -2 FINE; -3 MICRO-FINE
- MATERIAL DESIGNATION (SEE MAT'L TABLE)

NOTES:

1. MATERIAL:
   - O-RING: BUNA-N (STEEL & BRASS VALVE)
     VITON (STAINLESS STEEL VALVE)
   - BACK-UP RING: TEFLON OR NYLON
   - BODY: SEE MATERIAL TABLE
2. OTHER MATERIALS AVAILABLE
3. RECOMMENDED MAX. WORKING PRESSURE:
   - STEEL & ST'N STEEL VALVE: 10 000 PSI
   - BRASS VALVE: 2000 PSI
4. PANEL MOUNTING KIT AVAILABLE FOR ALL SIZE VALVES. SPECIFY WHEN ORDERING (SEE PART NO. ⑫)
5. SPECIAL NEEDLES IN 1/8 AND 1/4 VALVES FOR MICRO-FINE AND FINE METERING AVAILABLE. SPECIFY WHEN ORDERING (SEE CHART "Ⓐ" AND NEEDLE DETAIL)

NO.	DESCRIPTION / MODEL NO. →	MV-230	MV-430	MV-630	MV-830	MV-1230
1	BODY	14-B-29	2-B-34	5-B-24	8-B-27	11-B-23
2	NEEDLE (STANDARD)	14-B-16	2-A-18	5-A-13	8-B-17	11-B-15
3	BONNET	14-A-11	2-A-19	5-A-9	8-A-12	11-A-10
4	HANDLE	14-B-8	2-B-20	5-A-18	8-B-22	11-B-20
5	FOLLOWER, O-RING	14-A-12	2-A-28	5-A-17	8-A-13	11-A-13
6	WASHER, O-RING	14-A-13	2-A-23	5-A-12	8-A-14	11-A-14
7	O-RING	O-010-1	O-011-1	O-012-1	O-111-1	O-112-1
8	BACK-UP RING	400-A-4-1	400-A-4-2	400-A-4-3	400-A-4-4	400-A-4-5
9	MARKING WASHER	14-A-15	2-A-21	5-A-11	8-A-16	11-A-12
10	MARKING WASHER	14-A-14	2-A-22	5-A-10	8-A-15	11-A-11
11	NUT, SELF LOCKING	14-A-27	14-A-27	5-A-22	8-A-25	8-A-25
12	MOUNTING KIT	MVK-2	MVK-4	MVK-6	MVK-8	MVK-12

NEEDLE DETAIL



NEEDLE-2 FINE-METERING

NEEDLE-3 MICRO-FINE METERING

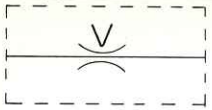
SEE CHART "Ⓐ" AND NOTE #5

MANATROL
A DIVISION OF THE PERRY-FAY CO.
200 PERRY CT. ELYRIA, OHIO

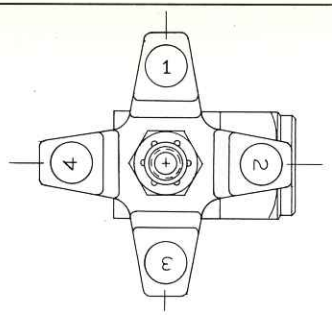
SCALE: --- APPROVED BY T.E. 4-24-64 DRAWN BY W.W.A.
DATE: 3-26-64 REVISED

ASS'Y - METERING VALVE, MS 33656 PORTS, IN-LINE (SIZES: 4-12)

MODEL: MV SERIES DRAWING NUMBER 203-C-200



J.I.C. SYMBOL



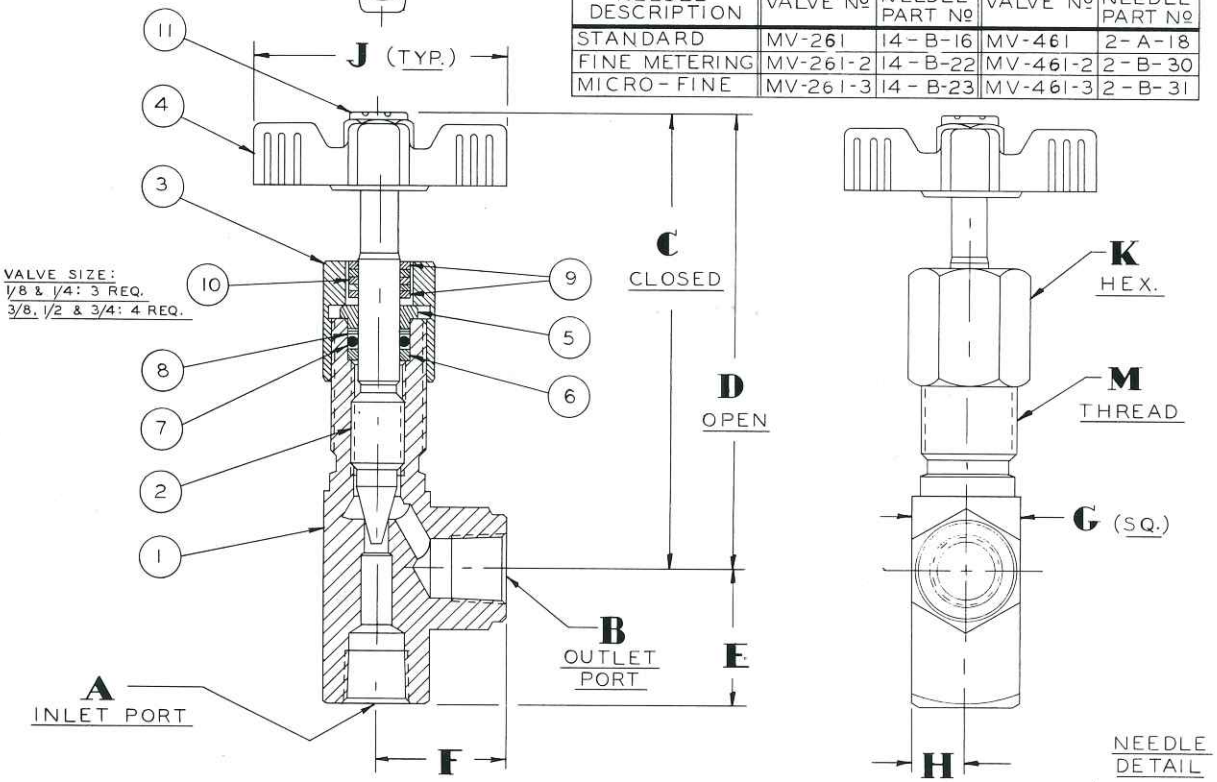
MATERIAL TABLE	
✠	BODY MATERIAL
-S	STEEL
-B	BRASS
-SS6	316 ST'N. ST'L

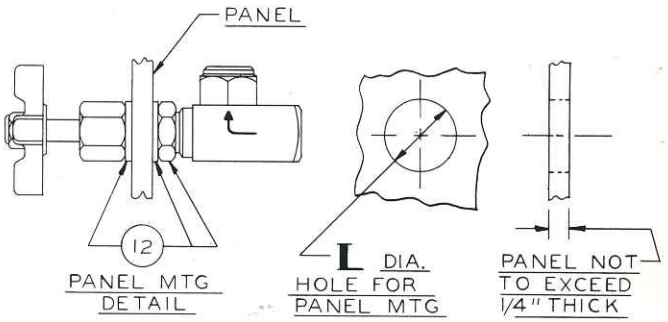
DIMENSION TABLE

MODEL NO.	LETTER A PORT	B PORT	C	D	E	F	G	H	J	K	L	M
-261	1/8 NPTF	1/8 NPTF	2.51	2.71	.75	.75	.62	.31	1.50	.62	.59	9/16 - 18
-461	1/4 NPTF	1/4 NPTF	3.20	3.40	1.09	1.07	.81	.40	2.00	.87	.78	3/4 - 20
-661	3/8 NPTF	3/8 NPTF	3.92	4.21	1.21	1.25	1.00	.50	2.50	1.00	.90	7/8 - 20
-861	1/2 NPTF	1/2 NPTF	4.59	5.09	1.50	1.45	1.25	.62	3.00	1.25	1.15	1 1/8 - 18
-1261	3/4 NPTF	3/4 NPTF	5.03	5.57	1.62	1.75	1.50	.75	4.00	1.62	1.40	1 3/8 - 12

CHART "A"

NEEDLE DESCRIPTION	VALVE Nº	NEEDLE PART Nº	VALVE Nº	NEEDLE PART Nº
STANDARD	MV-261	14-B-16	MV-461	2-A-18
FINE METERING	MV-261-2	14-B-22	MV-461-2	2-B-30
MICRO-FINE	MV-261-3	14-B-23	MV-461-3	2-B-31





INSTRUCTION FOR ORDERING VALVES
(USE SAMPLE MODEL NO. AS SHOWN)

MV - 461 - ✳ - ✠

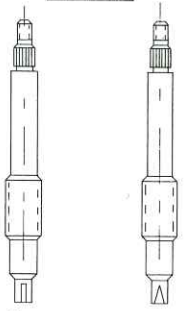
- MODEL DESIGNATION
- STYLE NO.
- NEEDLE DESIGNATION
  - STANDARD
  - 2 FINE
  - 3 MICRO-FINE
- MATERIAL DESIGNATION (SEE MAT'L TABLE)

NOTES:

1. MATERIAL:
   - O-RING: BUNA-N (STEEL & BRASS VALVE)
     VITON (STAINLESS STEEL VALVE)
   - BACK-UP RING: TEFLON OR NYLON
   - BODY: SEE MATERIAL TABLE
2. OTHER MATERIAL AVAILABLE
3. RECOMMENDED MAX WORKING PRESSURE:
   - STEEL & STAINLESS STEEL VALVE: 10,000 P.S.I.
   - BRASS VALVE: 2,000 P.S.I.
4. PANEL MOUNTING KIT AVAILABLE FOR ALL SIZE VALVES. SPECIFY WHEN ORDERING (SEE PART NO. (12))
5. SPECIAL NEEDLES IN 1/8 AND 1/4 VALVES FOR FINE AND MICRO-FINE METERING AVAILABLE. SPECIFY WHEN ORDERING (SEE CHART "A" AND NEEDLE DETAIL)

NO.	DESCRIPTION MODEL NO. →	MANATROL PART NO. MV-261	MV-461	MV-661	MV-861	MV-1261
1	BODY	14-B-37	2-B-47	5-B-31	8-B-35	11-B-29
2	NEEDLE (STANDARD)	14-B-16	2-A-18	5-A-13	8-B-17	11-B-15
3	BONNET	14-A-11	2-A-19	5-A-9	8-A-12	11-A-10
4	HANDLE	14-B-8	2-B-20	5-A-18	8-B-22	11-B-20
5	FOLLOWER, O-RING	14-A-12	2-A-28	5-A-17	8-A-13	11-A-13
6	WASHER, O-RING	14-A-13	2-A-23	5-A-12	8-A-14	11-A-14
7	O-RING	O-010-1	O-011-1	O-012-1	O-111-1	O-112-1
8	BACK-UP RING	400-A-4-1	400-A-4-2	400-A-4-3	400-A-4-4	400-A-4-5
9	MARKING WASHER	14-A-15	2-A-21	5-A-11	8-A-16	11-A-12
10	MARKING WASHER	14-A-14	2-A-22	5-A-10	8-A-15	11-A-11
11	NUT, SELF LOCKING	14-A-27	14-A-22	5-A-22	8-A-25	8-A-25
12	MOUNTING KIT	MVK-2	MVK-4	MVK-6	MVK-8	MVK-12

NEEDLE DETAIL



NEEDLE-2
FINE METERING

NEEDLE-3
MICRO-FINE METERING
SEE CHART "A"
AND NOTE #5

TOLERANCE: UNLESS OTHERWISE SPECIFIED ALL FRACTIONAL DIM. ± .015"—ANGLES ± 2 DEGREE BREAK ALL SHARP EDGES. DO NOT SCALE DRAWINGS.

LET.	DATE	REVISIONS	By	CHK

MANATROL
A DIVISION OF THE PERRY-FAY CO.
200 PERRY CT. ELYRIA, OHIO

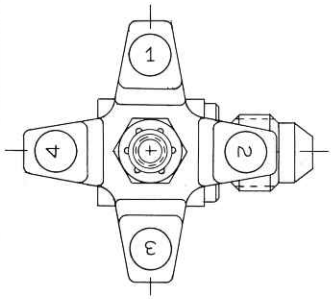
SCALE: #
APPROVED BY E.S. 6-16-64
DRAWN BY W.W.A.
DATE: 6-16-64
REVISED

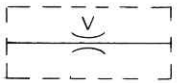
ASS'Y - METERING VALVE, INTERNAL NPTF PORTS, ANGLE, (SIZES: 1/8 - 3/4)

MODEL: MV SERIES

DRAWING NUMBER 203-C-241

MATERIAL TABLE	
❁	BODY MATERIAL
-S	STEEL
-B	BRASS
-SS6	316 ST'N. ST'L





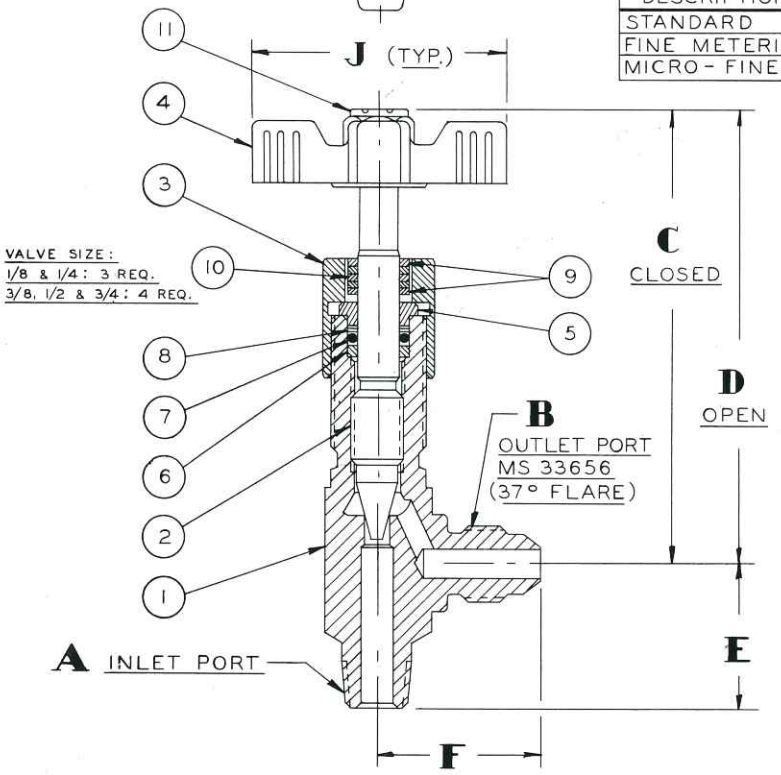
J.I.C. SYMBOL

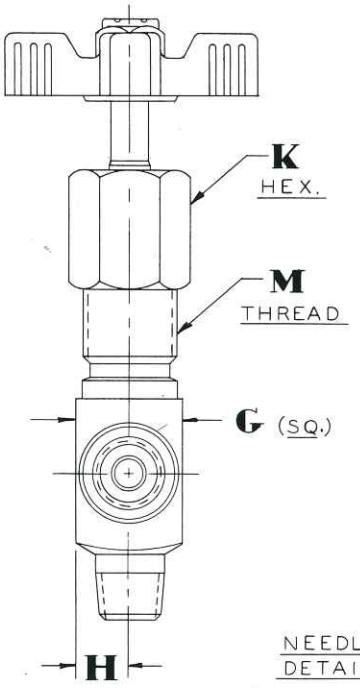
DIMENSION TABLE

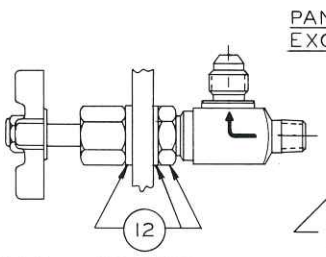
MOD. NO.	LETTER A PORT	B PORT	TUBE O.D.	C	D	E	F	G	H	J	K	L	M
-265	1/8 NPTF	MS 33656-4 (7/16-20-UNF-3A)	1/4	2.51	2.71	.87	.96	.62	.31	1.50	.62	.59	9/16 - 18
-465	1/4 NPTF	MS 33656-6 (9/16-18-UNF-3A)	3/8	3.20	3.40	1.21	1.09	.81	.40	2.00	.87	.78	3/4 - 20
-665	3/8 NPTF	MS 33656-8 (3/4-16 UNF-3A)	1/2	3.92	4.21	1.37	1.31	1.00	.50	2.50	1.00	.90	7/8 - 20
-865	1/2 NPTF	MS 33656-10 (7/8-14 UNF-3A)	5/8	4.59	5.09	1.68	1.56	1.25	.62	3.00	1.25	1.15	1 1/8-18
-1265	3/4 NPTF	MS 33656-12 (1 1/16-12 UN -3A)	3/4	5.03	5.57	1.87	1.78	1.50	.75	4.00	1.62	1.40	1 3/8-12

CHART Ⓐ

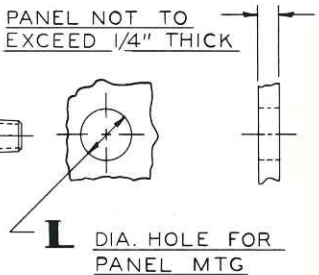
NEEDLE DESCRIPTION	VALVE Nº	NEEDLE PART Nº	VALVE Nº	NEEDLE PART Nº
STANDARD	MV-265	14-B-16	MV-465	2-A-18
FINE METERING	MV-265-2	14-B-22	MV-465-2	2-B-30
MICRO-FINE	MV-265-3	14-B-23	MV-465-3	2-B-31







PANEL MTG. DETAIL



INSTRUCTION FOR ORDERING VALVES
(USE SAMPLE MODEL NO. AS SHOWN)

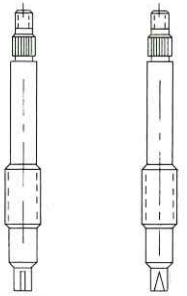
MV - 465 - ✳ - ❁

- MODEL DESIGNATION
- STYLE NO.
- NEEDLE DESIGNATION: STANDARD, -2 FINE, -3 MICRO-FINE
- MATERIAL DESIGNATION (SEE MAT'L TABLE)

NOTES:
1. MATERIAL
   - O-RING: BUNA-N (STEEL & BRASS VALVE)
     VITON (STAINLESS STEEL VALVE)
   - BACK-UP RING: TEFLON OR NYLON
   - BODY: SEE MATERIAL TABLE
2. OTHER MATERIAL AVAILABLE
3. RECOMMENDED MAX. WORKING PRESSURE:
   - STEEL & STAINLESS STEEL VALVE: 10,000 PSI
   - BRASS VALVE: 2,000 PSI
4. PANEL MOUNTING KIT AVAILABLE FOR ALL SIZE VALVES. SPECIFY WHEN ORDERING (SEE PART NO. ⑫)
5. SPECIAL NEEDLES IN 1/8 AND 1/4 VALVES FOR FINE AND MICRO-FINE METERING AVAILABLE. SPECIFY WHEN ORDERING (SEE CHART "Ⓐ" AND NEEDLE DETAIL)

NO.	DESCRIPTION: MODEL NO. →	MANATROL PART NO. MV-265	MV-465	MV-665	MV-865	MV-1265
1	BODY	14-B-32	2-B-42	5-B-26	8-B-31	11-B-25
2	NEEDLE STANDARD	14-B-16	2-A-18	5-A-13	8-B-17	11-B-15
3	BONNET	14-A-11	2-A-19	5-A-9	8-A-12	11-A-10
4	HANDLE	14-B-8	2-B-20	5-A-18	8-B-22	11-B-20
5	FOLLOWER, O-RING	14-A-12	2-A-28	5-A-17	8-A-13	11-A-13
6	WASHER, O-RING	14-A-13	2-A-23	5-A-12	8-A-14	11-A-14
7	O-RING	O-010-1	O-011-1	O-012-1	O-111-1	O-112-1
8	BACK-UP RING	400-A-4-1	400-A-4-2	400-A-4-3	400-A-4-4	400-A-4-5
9	MARKING WASHER	14-A-15	2-A-21	5-A-11	8-A-16	11-A-12
10	MARKING WASHER	14-A-14	2-A-22	5-A-10	8-A-15	11-A-11
11	NUT, SELF LOCKING	14-A-27	14-A-27	5-A-22	8-A-25	8-A-25
12	MOUNTING KIT	MVK-2	MVK-4	MVK-6	MVK-8	MVK-12

NEEDLE DETAIL



NEEDLE-2 FINE METERING

NEEDLE-3 MICRO-FINE METERING SEE CHART "Ⓐ" AND NOTE #5

TOLERANCE: UNLESS OTHERWISE SPECIFIED ALL FRACTIONAL DIM. ± .015"—ANGLES ± 2 DEGREE BREAK ALL SHARP EDGES. DO NOT SCALE DRAWINGS.

LET.	DATE	REVISIONS	BY	CHK

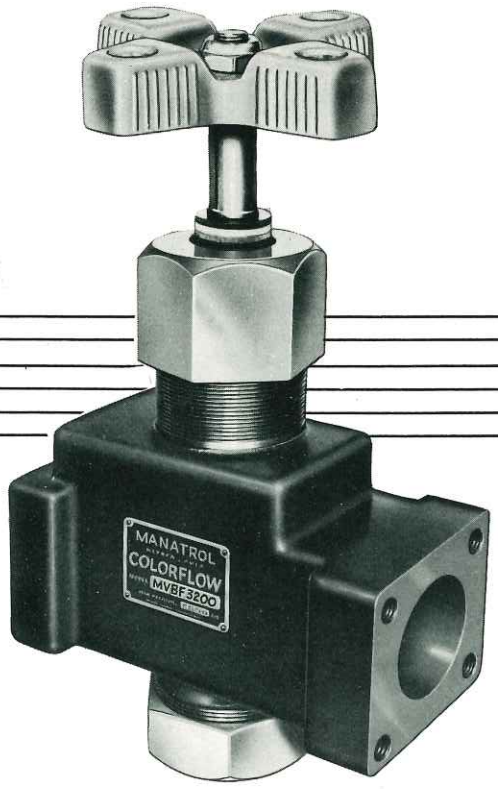
MANATROL
A DIVISION OF THE PERRY-FAY CO.
200 PERRY CT. ELYRIA, OHIO

SCALE: —/— APPROVED BY T.Z 4-24-64 DRAWN BY W.W.A.
DATE: 4-23-64 REVISED

ASS'Y - METERING VALVE, EXT. NPTF TO MS 33656 PORTS, ANGLE, SIZES: 1/8-3/4
MODEL: MV SERIES
DRAWING NUMBER 203-C-219

MANATROL FULLY BALANCED THROTTLING VALVE

MVBF SERIES



The new Manatrol MVBF Throttling Valve is fully balanced and requires the same low torque to open or close whether the pressure on it is 0 PSI or 5000 PSI.

In conventional throttling valves, pressure acts on one area at all times subjecting the needle to high axial forces. With the Manatrol MVBF Throttling Valve these forces have been completely eliminated.

This balancing feature is accomplished by the pressure acting on two **EQUAL AREAS** at all times regardless if the valve is opened or closed, thus cancelling any forces which are developed due to high pressures.

In the Manatrol MVBF Valves, the pressure drop is kept at a minimum

All Manatrol Balanced Throttling Valves are made of ductile iron with flanged mountings and having a 5000 PSI maximum operating pressure.

HOW TO ORDER

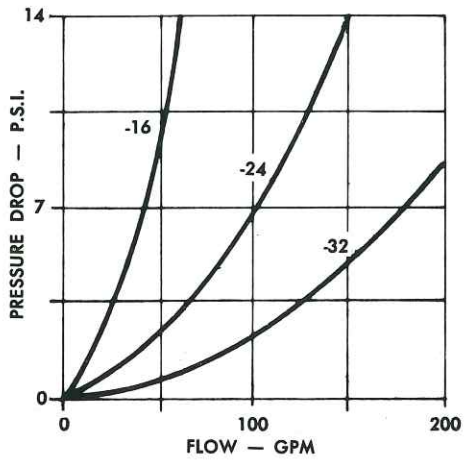
MVBF - 2400

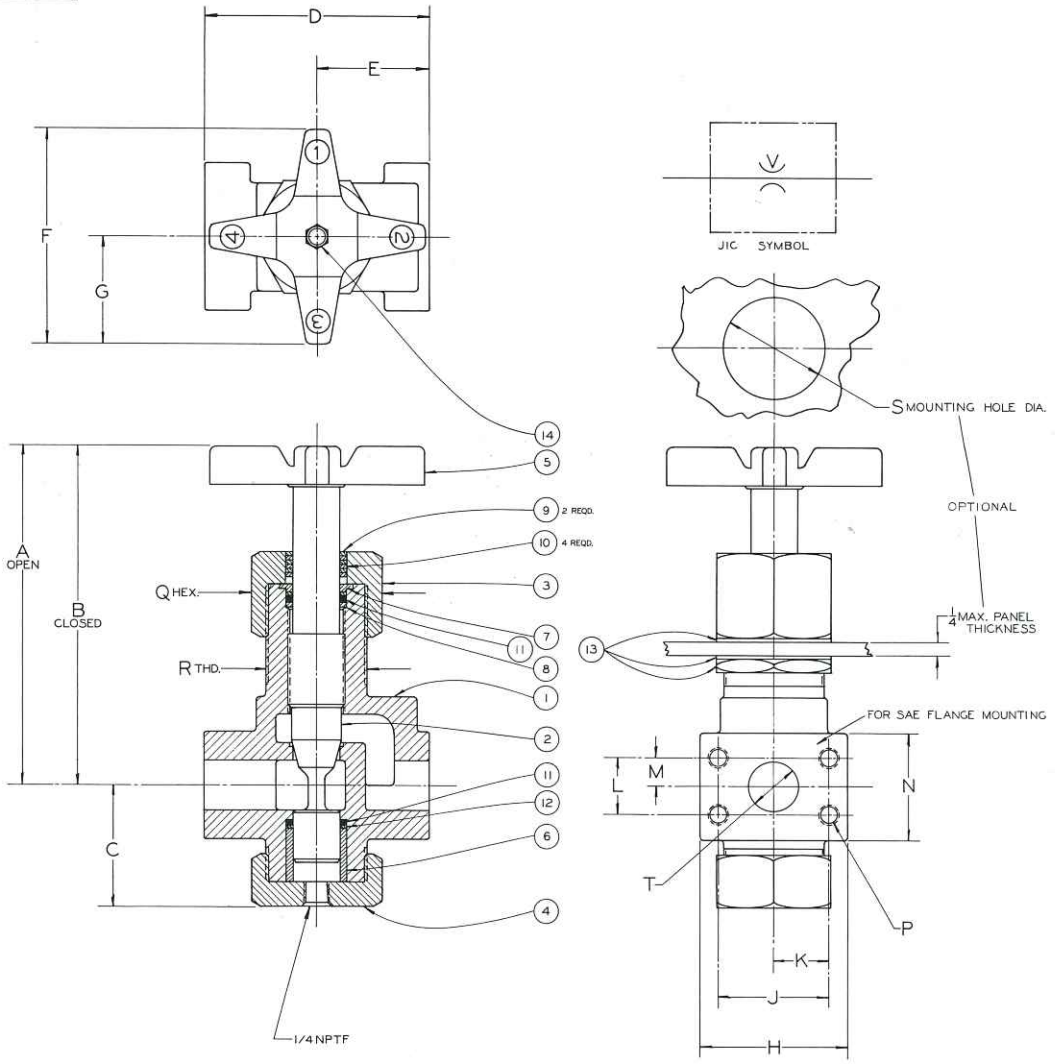
SERIES

Metering Value
Balanced Flange
Mounting

SIZE

1" = 1600
1½" = 2400
2" = 3200





	MVBF-1600	MVBF-2400	MVBF-3200
A	7.21	8.25	9.78
B	6.71	7.25	8.78
C	2.28	3.15	3.59
D	4.18	5.93	6.93
E	2.09	2.96	3.46
F	4.00	4.00	4.00
G	2.00	2.00	2.00
H	2.75	3.75	4.00
J	2.06	2.75	3.06
K	1.03	1.37	1.53
L	1.03	1.40	1.68
M	.51	.70	.84
N	2.00	3.25	3.50
P	3/8-16 5/8 DEEP	1/2-13 3/4 DEEP	1/2-13 3/4 DEEP
Q	2.12	3.00	3.25
R	1 7/8-12	2 3/4-12	3-12
S	1.90	2.78	3.03
T	1.00	1.50	2.00

NO.	PARTS LIST	MVBF-1600	MVBF-2400	MVBF-3200
1	BODY	25-C-141	26-C-46	30-C-45
2	NEEDLE	25-B-121	26-B-48	30-B-38
3	BONNET	25-A-123	26-A-49	30-A-41
4	END CAP	25-A-131	26-A-50	30-A-42
5	HANDLE	25-B-144	25-B-144	25-B-144
6	SUPPORT, O-RING	25-A-130	26-A-51	30-A-47
7	FOLLOWER, O-RING	25-A-127	26-A-52	30-A-43
8	WASHER, O-RING	25-A-126	26-A-53	30-A-44
9	MARKING WASHER	25-A-128	26-A-54	30-A-46
10	MARKING WASHER	25-A-129	26-A-55	30-A-45
11	O-RING	0-119-1	0-325-1	0-328-1
12	BACK-UP RING	400-A-4-6	400-A-4-7	400-A-4-8
13	PANEL MOUNT KIT	MVK-16	MVK-24	MVK-32
14	SELF LOCKING NUT	8-A-25	8-A-25	8-A-25

PANEL MOUNT KIT IS OPTIONAL, AND MUST BE ORDERED BY PART NO. SEE ITEM 13 IN PARTS LIST

MANATROL
A DIVISION OF THE DERRY-FAY CO.
330 PERRY ST. ELYRIA, OHIO

TITLE: BALANCED NEEDLE VALVE, FLANGED MOUNT

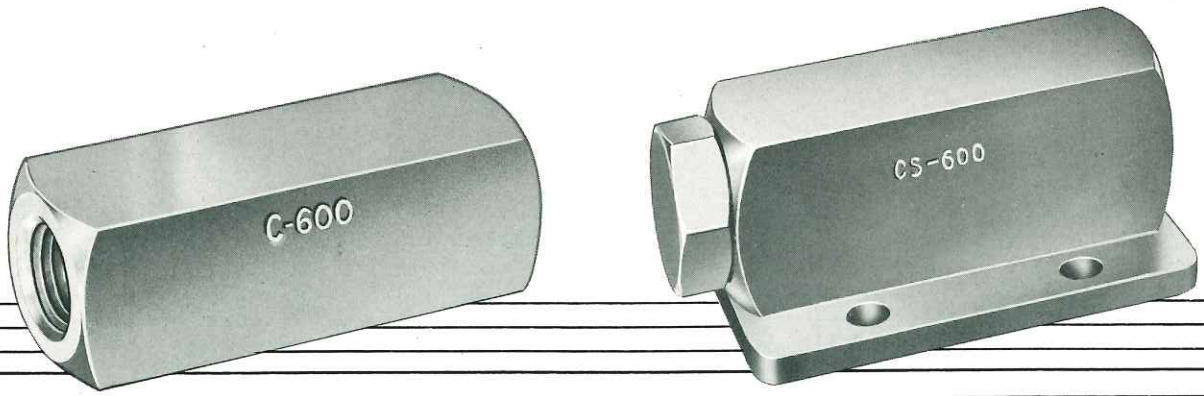
MATERIAL: MVBF-1600, 2400, 3200

SCALE: —

DATE: 6-1-64

STOCK NO.: 203-D-231

C AND CS SERIES



LINE MOUNTED CHECK VALVE C SERIES

SUB-PLATE MOUNTED CHECK VALVE CS SERIES

The Manatrol Check Valve allows free flow in one direction and blocks flow in the opposite direction. A soft poppet seal insures positive shutoff even in applications where the medium is low pressure air.

The "C" and "CS" Series Check Valves have excellent flow characteristics which insure low pressure drop and quiet, fast-acting performance. The problems of chattering have been virtually eliminated due to the design of the valve, which also incorporates a guided poppet to eliminate any possibility of poppet cocking.

Manatrol Check Valves are available in brass, steel, and stainless steel. These various body materials, combined with a wide choice of sealing materials and line or sub-plate mounting, permit these valves to be used in Chemical processing as well as pneumatic and hydraulic circuitry.

HOW TO ORDER

Example : C - 200 - B (This is a check valve with ⅛ inch NPTF ports made of brass.)

SIZE

2 = ⅛"
4 = ¼"
6 = ⅜"
8 = ½"
12 = ¾"
16 = 1"
20 = 1¼"
24 = 1½"
32 = 2"

MATERIAL

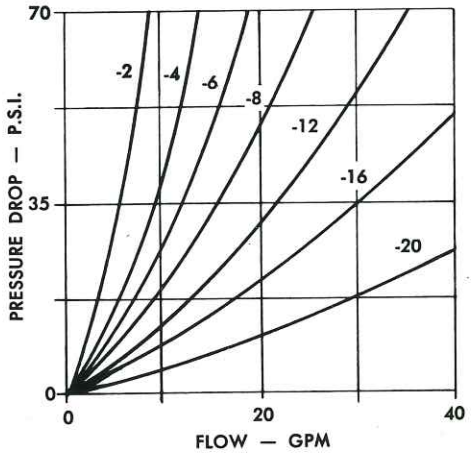
B = Brass
S = Steel
SS = 303 Stainless
SS6 = 316 Stainless

THREAD STYLE

00 = NPTF
10 = AND 10050
20 = SAE

SERIES

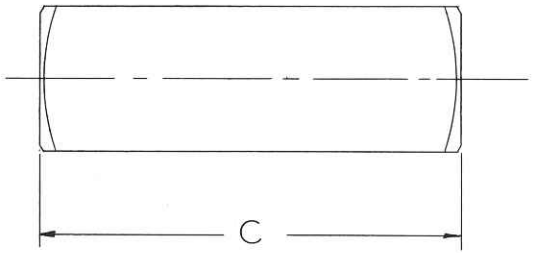
C = Check Valve Line Mounted
CS = Check Valve, Sub Plate, Mounted.

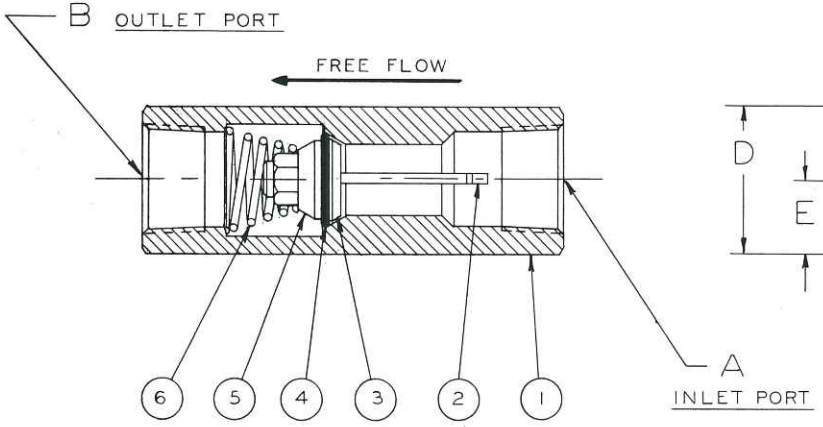


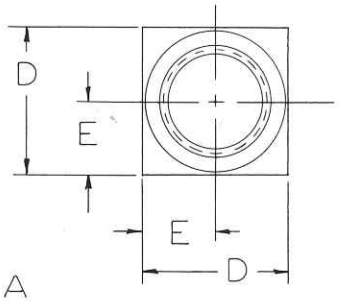
* available in steel only.

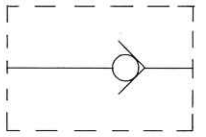
MATERIAL TABLE	
✳	BODY MATERIAL
-S	STEEL B 1113
-SS	303 ST'N ST'L
-SS6	316 ST'N ST'L
-B	BRASS SAE-72

DIMENSION TABLE					
MOD. NO.	LETTER				
	A PORT	B PORT	C	D	E
-200	1/8 NPTF	1/8 NPTF	1.75	.62	.31
-400	1/4 NPTF	1/4 NPTF	2.37	.81	.40
-600	3/8 NPTF	3/8 NPTF	2.75	1.00	.50
-800	1/2 NPTF	1/2 NPTF	3.18	1.18	.59
-1200	3/4 NPTF	3/4 NPTF	3.56	1.50	.75
-1600	1" NPTF	1" NPTF	5.00	1.75	.87
-2000	1¼" NPTF	1¼" NPTF	6.25	2.25	1.12
-2400	1½" NPTF	1½" NPTF	7.12	2.75	1.37
-3200	2" NPTF	2" NPTF	7.75	3.50	1.75








J.I.C. SYMBOL

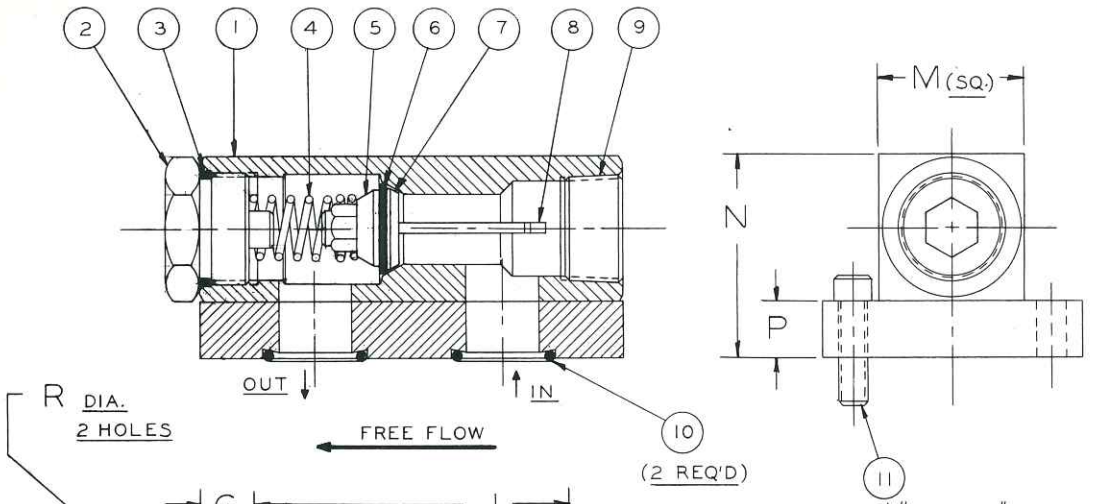
NOTES:
1. MATERIAL:
   SEAL: BUNA-N (STEEL & BRASS VALVE)
   VITON (ST'N. ST'L VALVE)
   BODY: SEE MATERIAL TABLE
2. OTHER MATERIALS, CRACKING PRESSURE & PORT CONNECTIONS AVAILABLE
3. ST'D CRACKING PRESSURE: 1 P.S.I.
4. RECOMMENDED MAX. WORKING PRESSURE:
   STEEL & ST'N. ST'L VALVE: 5000 P.S.I.
   BRASS VALVE: 2000 P.S.I.

NO.	DESCRIPTION / MODEL NO. →	MANATROL PART NO. C-200	C-400	C-600	C-800	C-1200	C-1600	C-2000	C-2400	C-3200
1	BODY	13-B-1	1-B-1	4-B-1	7-B-1	10-B-1	25-B-1	22-B-10	26-B-1	30-B-1
2	GUIDE BLADE	13-A-3	1-A-40	4-A-129	7-A-75	10-A-133	25-A-93	22-A-55	26-A-23	30-A-14
3	POPPET RETAINER	13-A-12	1-A-10	4-A-12	7-A-12	10-A-12	25-A-13	22-A-12	26-A-5	30-A-6
4	POPPET SEAL	13-A-25	1-A-28	4-A-31	7-A-27	10-A-25	25-A-17	22-A-21	26-A-14	30-A-9
5	POPPET	13-A-6	1-A-6	4-A-11	7-A-11	10-A-11	25-A-2	22-A-16	26-A-3	30-A-11
6	SPRING	13-A-8	1-A-8	4-A-8	7-A-8	10-A-8	25-A-16	22-A-7	26-A-15	30-A-10

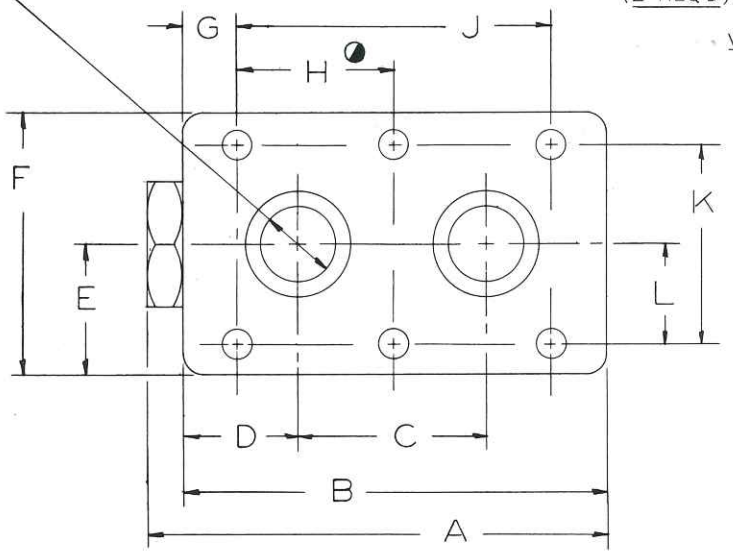
MANATROL
A DIVISION OF THE PERRY-FAY CO.
200 PERRY CT. ELYRIA, OHIO

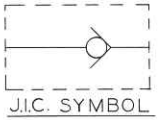
SCALE: #
DATE: 5-29-63
APPROVED BY E.S. 6-9-64
DRAWN BY W.W.A.
REVISED

ASSEMBLY - CHECK VALVE, NPTF PORTS, SIZES: 1/8 THRU 2"
MODEL: "C" SERIES
DRAWING NUMBER 203-C-6



VALVE SIZE: 1/8" THRU 1/2" — 4 REQ'D
3/4" THRU 2" — 6 REQ'D





J.I.C. SYMBOL

DIMENSION TABLE

MOD. NO.	LETTER													
	A	B	C	D	E	F	G	H	J	K	L	M	N	P
-200	1.98	1.75	.62	.56	.81	1.62	.50	—	.75	1.12	.56	.62	.80	.18
-400	2.79	2.50	1.00	.75	.90	1.81	.56	—	1.37	1.31	.65	.81	.99	.18
-600	3.06	2.75	1.00	.87	1.00	2.00	.71	—	1.32	1.50	.75	1.00	1.18	.18
-800	3.49	3.18	1.18	1.00	1.12	2.25	.84	—	1.50	1.75	.87	1.25	1.54	.36
-1200	4.49	4.09	2.14	.98	1.43	2.87	.54	1.50	3.00	2.12	1.06	1.50	1.95	.45
-1600	5.40	5.00	2.25	1.37	1.56	3.12	.62	1.87	3.75	2.37	1.18	1.75	2.42	.67
-2000	6.90	6.25	3.12	1.56	1.93	3.87	.75	2.37	4.75	3.00	1.50	2.25	2.92	.67
-2400	7.53	7.12	3.75	1.68	2.25	4.50	.75	2.81	5.62	3.62	1.81	2.75	3.87	1.12
-3200	7.43	6.75	3.50	1.50	2.62	5.25	.75	2.62	5.25	4.37	2.18	3.50	4.62	1.12

MOD. NO.	RECOMMENDED MAX. FLOW G.P.M.	CONNECTOR BORE "R" DIA.
-200	1 3/4	.21
-400	3	.28
-600	6	.40
-800	10	.50
-1200	20	.68
-1600	28	.87
-2000	45	1.12
-2400	65	1.37
-3200	100	1.87

NOTES:

1. MATERIAL:
   O-RINGS AND SEAL:
   BUNA-N (STEEL VALVE)
2. ST'D CRACKING PRESSURE: 5 PSI
3. OTHER MATERIALS AND CRACKING PRESSURE AVAILABLE
4. RECOMMENDED MAX. WORKING PRESSURE: 5000 P.S.I.
5. ◔ "H" DIMENSION TO BE USED ONLY WITH 3/4" & UP VALVES

NO.	DESCRIPTION MODEL NO. →	MANATROL PART NO. CS-200	CS-400	CS-600	CS-800	CS-1200	CS-1600	CS-2000	CS-2400	CS-3200
1	BODY, SUB-ASS'Y	13-B-68	1-B-153	4-B-135	7-B-80	10-B-138	25-B-105	22-B-65	26-B-38	30-B-32
2	END PLUG ASS'Y	13-A-69	1-A-154	4-A-136	7-A-81	10-A-139	25-A-106	22-A-66	26-A-39	30-B-30
3	O-RING, END PLUG	00-4-2	00-6-2	00-8-2	00-10-2	00-12-2	00-16-2	00-24-2	00-28-2	0-149-2
4	SPRING, POPPET	13-A-18	1-A-3	4-A-15	7-A-9	10-A-9	25-A-23	22-A-3	26-A-35	30-A-29
5	POPPET	13-A-6	1-A-6	4-A-11	7-A-11	10-A-11	25-A-2	22-A-16	26-A-3	30-A-11
6	POPPET SEAL	13-A-25	1-A-28	4-A-31	7-A-27	10-A-25	25-A-17	22-A-21	26-A-14	30-A-9
7	POPPET RETAINER	13-A-12	1-A-10	4-A-12	7-A-12	10-A-12	25-A-13	22-A-12	26-A-5	30-A-6
8	GUIDE BLADE	13-A-3	1-A-40	4-A-129	7-A-75	10-A-133	25-A-93	22-A-55	26-A-23	30-A-14
9	END PLUG	13-A-54	1-A-131	4-A-103	8-A-3	10-A-103	25-A-60	22-A-38	26-A-36	30-A-28
10	O-RING, BODY	0-010-1	0-012-1	0-111-1	0-113-1	0-116-1	0-214-1	0-218-1	0-222-1	0-226-1
11	MOUNTING SCREW	1/4-20 NC×5/8	1/4-20 NC×5/8	1/4-20 NC×5/8	1/4-20 NC×7/8	5/16-18 NC×1"	5/16-18 NC×1 1/4	7/16-20 NF×1 1/4	1/2-20 NF×1 3/4	1/2-20 NF×1 3/4

MANATROL
A DIVISION OF THE PERRY-FAY CO.
200 PERRY CT. ELYRIA, OHIO

SCALE: —
DATE: 6-4-63
APPROVED BY: E.S. 6-9-64
DRAWN BY: W.W.A.
REVISED:

ASS'Y - CHECK VALVE, SUB-PLATE MOUNTING, SIZES: 1/8 THRU 2"
MODEL: "CS" SERIES
DRAWING NUMBER: 203-C-21

CP AND CPS SERIES

MANATROL LINE MOUNTED PILOT OPERATED CHECK VALVE CP SERIES

MANATROL SUB-PLATE MOUNTED, PILOT OPERATED CHECK VALVE CPS SERIES

Manatrol Pilot Operated Check Valves allow free flow in one direction and block flow in the opposite direction until pressure is applied at the pilot port. Application of pressure to the pilot, unseats the poppet allowing flow in either direction. The choice of either oil or air piloting adds to the versatility of this series. This feature makes these valves suitable for use in straight oil circuit or air-over-oil circuit.

Two style poppets are offered which provide either a 5:1 or 40:1 ratio between the pilot pressure and check line pressure. The 5:1 poppet is a solid one-piece, high alloy steel poppet which is carefully lapped to a true contour to assure positive sealing. To prevent excessive fluid shock, a 40:1 poppet is available. This poppet employs a two-stage, decompression type poppet which bleeds off the checked line pressure before the large poppet area is opened.

On any Manatrol Pilot Operated Check Valve where the application calls for an air working line, (i.e. Manatrol ACP or ACPS style) the poppet is equipped with a soft seal to assure positive sealing, even when conditions are such that low pressure air is present and must be checked to a bubble tight shut off.

Manatrol Pilot Operated Check Valves are available in sub-plate or in-line mountings and in sizes from ¼ inch through 1¼ inches with maximum pressure ratings of 5000 PSI.

Flange mounting available on special order.

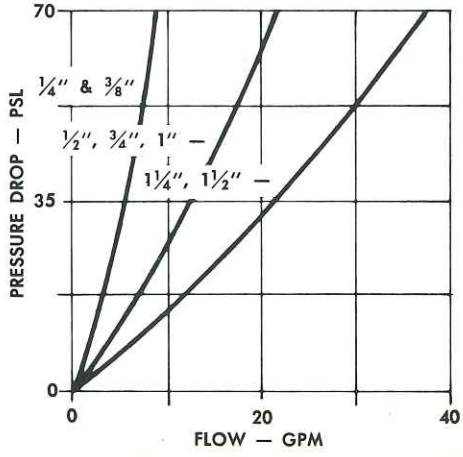
HOW TO ORDER

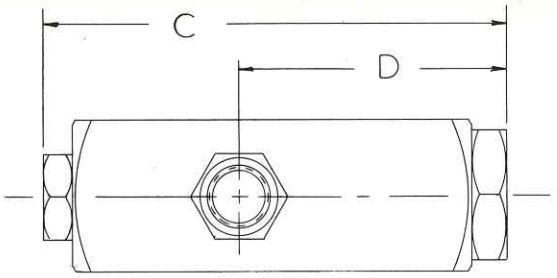
Example: CP - 600 - 5 **(This is a line mounted pilot operated check valve with ⅜ NPTF PORTS and having the poppet with a 5:1 ratio.)**

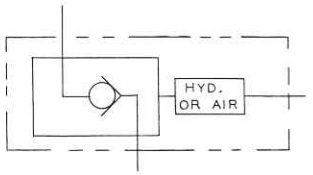
POPPET RATIO
5 = 5:1
40 = 40:1

SERIES

		SIZE
CP = Line Mounted:	Hydraulic Pilot Pressure Hydraulic Working Line	4 = ¼" 6 = ⅜" 8 = ½" 12 = ¾" 16 = 1" 20 = 1¼" 24 = 1½"
ACP = Line Mounted:	Air Pilot Pressure Air Working Line	
BACP = Line Mounted:	Air Pilot Pressure Hydraulic Working Line	
CPS = Sub-Plate Mounted:	Hydraulic Working Pressure Hydraulic Working Line	
ACPS = Sub-Plate Mounted:	Air Pilot Pressure Air Working Line	
BACPS = Sub-Plate Mounted:	Air Pilot Pressure Hydraulic Working Line	

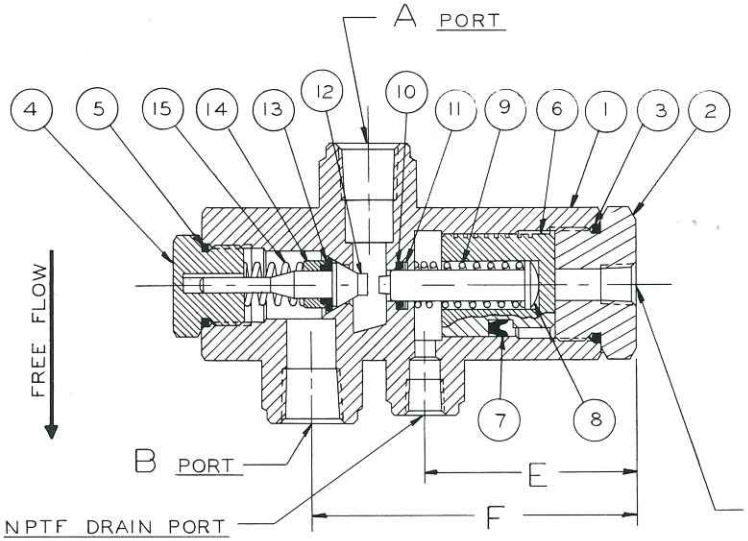


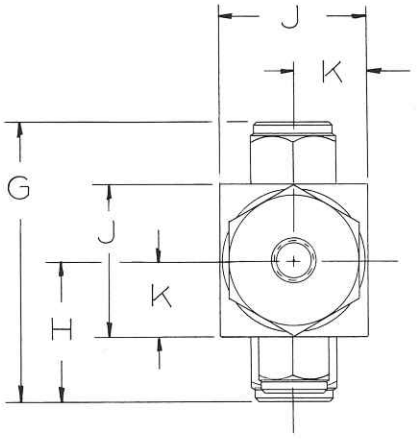




J.I.C. SYMBOL

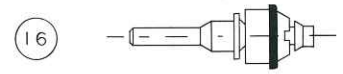
DIMENSION TABLE										
MOD. NO.	LETTER									
	A PORT	B PORT	C	D	E	F	G	H	J	K
-400	1/4 NPTF	1/4 NPTF	5.48	3.21	2.51	3.82	3.07	1.53	1.75	.87
-600	3/8 NPTF	3/8 NPTF	5.48	3.21	2.51	3.82	3.26	1.63	1.75	.87
-800	1/2 NPTF	1/2 NPTF	6.82	4.04	2.98	4.98	4.17	2.09	2.50	1.25
-1200	3/4 NPTF	3/4 NPTF	6.82	4.04	2.98	4.98	4.51	2.25	2.50	1.25
-1600	1" NPTF	1" NPTF	6.82	4.04	2.98	4.98	5.76	2.89	2.50	1.25





1/4 NPTF PILOT PORT

2 STAGE POPPET SUB-ASS'Y
(AVAILABLE ON ALL MODELS)



PILOT TO POPPET RATIO 40:1

NOTES:
1. MODEL DESIGNATION:
   - CP: PILOT PRESS. — HYD. WORKING LINE — HYD.
   - ACP: PILOT PRESS. — AIR WORKING LINE — AIR
   - BACP: PILOT PRESS. — AIR WORKING LINE — HYD.
2. MATERIAL:
   - O-RINGS & PACKING: BUNA-N
   - POPPET SEAL: NYLON (HYD.) ; BUNA-N (AIR)
   - BACK-UP RING: TEFLON
   - BODY: STEEL
3. CRACKING PRESSURE IN FREE FLOW DIRECTION: CP - 15 P.S.I. ACP - 5 P.S.I., BACP - 15 P.S.I.
4. OTHER MATERIALS, CRACKING PRESSURE AND PORT CONNECTIONS AVAILABLE
5. RECOMMENDED MAX. WORKING PRESSURE IS 3000 P.S.I.

MANATROL PART NO.										
NO.	MODEL NO. →	CP-400 CP-600	ACP-400 ACP-600	BACP-400 BACP-600	CP-800 CP-1200	ACP-800 ACP-1200	BACP-800 BACP-1200	CP-1600	ACP-1600	BACP-1600
	DESCRIPTION									
1	BODY	1-B-195 (1/4) 4-B-154 (3/8)	1-B-195 (1/4) 4-B-154 (3/8)	1-B-195 (1/4) 4-B-154 (3/8)	7-B-95 (1/2) 10-B-155 (3/4)	7-B-95 (1/2) 10-B-155 (3/4)	7-B-95 (1/2) 10-B-155 (3/4)	25-B-116	25-B-116	25-B-116
2	END PLUG, PISTON	4-A-94	4-A-94	4-A-94	10-A-85	10-A-85	10-A-85	10-A-85	10-A-85	10-A-85
3	O-RING	00-16-2	00-16-2	00-16-2	0-137-2	0-137-2	0-137-2	0-137-2	0-137-2	0-137-2
4	END PLUG, POPPET	4-A-97	4-A-97	4-A-97	10-A-92	10-A-92	10-A-92	10-A-92	10-A-92	10-A-92
5	O-RING	00-10-2	00-10-2	00-10-2	00-16-2	00-16-2	00-16-2	00-16-2	00-16-2	00-16-2
6	PISTON	4-B-79	4-B-86	4-B-86	10-A-82	10-A-86	10-A-86	10-A-82	10-A-86	10-A-86
7	PISTON PACKING		4-A-98	4-A-98		10-A-93	10-A-93		10-A-93	10-A-93
8	PISTON ROD	4-A-89	4-A-89	4-A-89	10-A-83	10-A-83	10-A-83	10-A-83	10-A-83	10-A-83
9	SPRING, PISTON	4-A-93	4-A-93	4-A-93	10-A-97	10-A-97	10-A-97	10-A-97	10-A-97	10-A-97
10	O-RING	0-012-1	0-012-1	0-012-1	0-014-1	0-014-1	0-014-1	0-014-1	0-014-1	0-014-1
11	BACK-UP RING	BU-012	BU-012	BU-012	BU-014	BU-014	BU-014	BU-014	BU-014	BU-014
12	POPPET	4-A-78	4-A-78	4-A-78	10-A-79	10-A-79	10-A-79	10-A-79	10-A-79	10-A-79
13	POPPET SEAL	4-A-80	4-A-100	4-A-80	10-A-78	10-A-95	10-A-78	10-A-78	10-A-95	10-A-78
14	SEAL RETAINER	4-A-81	4-A-81	4-A-81	10-A-77	10-A-77	10-A-77	10-A-77	10-A-77	10-A-77
15	SPRING, POPPET	4-A-155	4-A-92	4-A-155	10-A-96	10-A-156	10-A-96	10-A-96	10-A-156	10-A-96
16	POPPET SUB-ASS'Y	4-A-110	4-A-127	4-A-110	10-A-110	10-A-129	10-A-110	10-A-110	10-A-129	10-A-110

LET.	CHANGES	DATE
E	REDRAWN & REVISED	9/23/63

MANATROL
A DIVISION OF THE PERRY-FAY CO.
200 PERRY CT. ELYRIA, OHIO

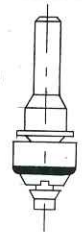
SCALE: NONE
DATE: 9-23-63
APPROVED BY: E.S. 6-10-64
DRAWN BY: W.W.A.
REVISED:

ASS'Y — PILOT OPERATED CHECK VALVE, OFFSET PORTING, SIZES: 1/4 THRU 1"

MODEL: CP, ACP & BACP SER.

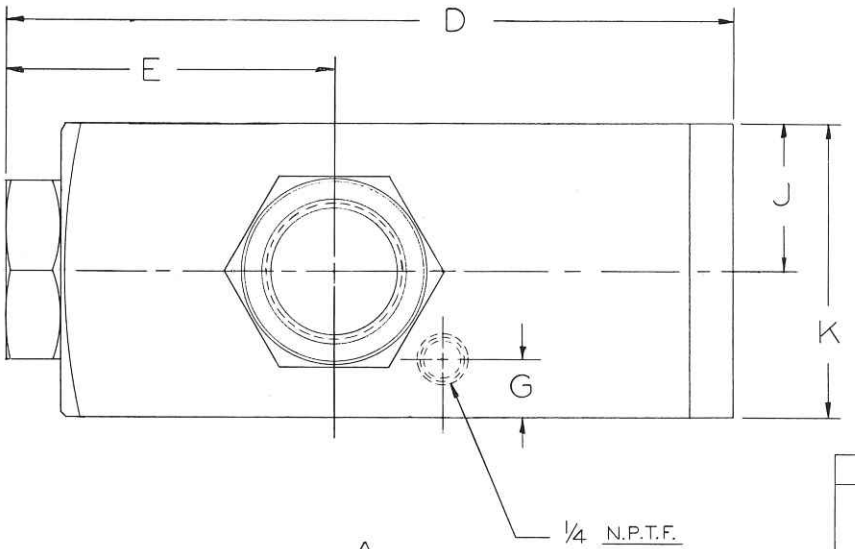
DRAWING NUMBER: 203-C-17

PILOT TO POPPET RATIO 40:1



2 STAGE POPPET SUB-ASS'Y (AVAILABLE ON ALL MODELS)

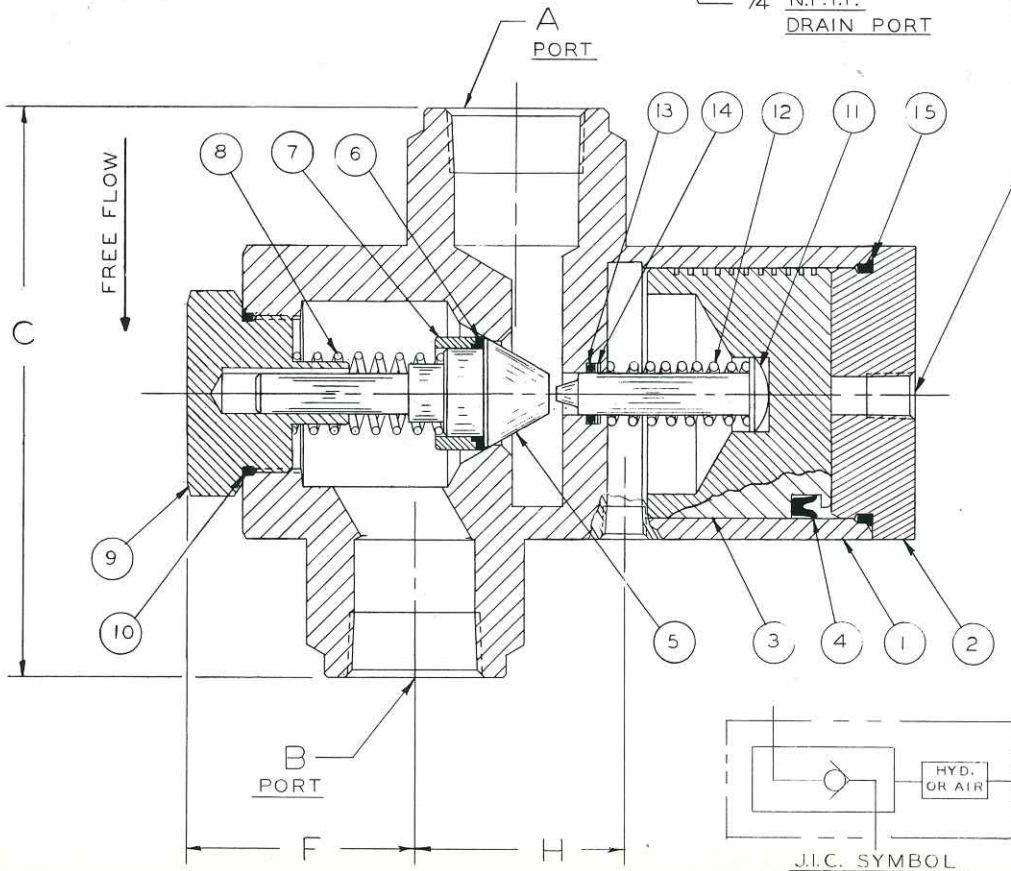
SCALE: NONE

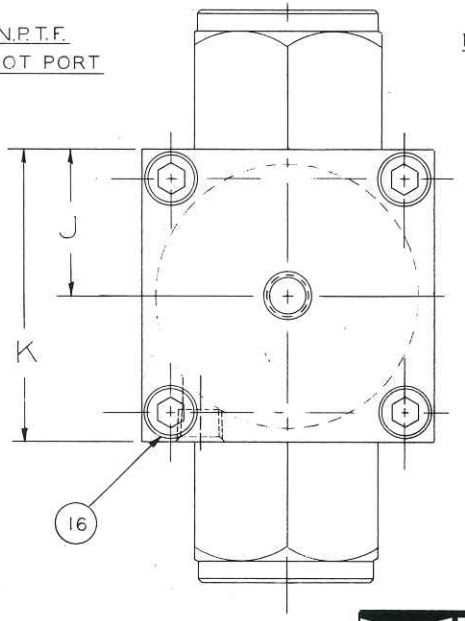


NO.	MODEL NO. → / DESCRIPTION	CP-2000 CP-2400 PART NO.	ACP-2000 ACP-2400 PART NO.	BACP-2000 BACP-2400 PART NO.	NO. REQ.
1	BODY	22-B-45 (1 1/4)	22-B-45 (1 1/4)	22-B-45 (1 1/4)	1
		26-B-18 (1 1/2)	26-B-18 (1 1/2)	26-B-18 (1 1/2)	1
2	END PLUG, PISTON	25-B-68	25-B-68	25-B-68	1
3	PISTON	25-B-70	25-B-71	25-B-71	1
4	PISTON PACKING		25-A-78	25-A-78	1
5	POPPET	25-A-73	25-A-73	25-A-73	1
6	POPPET SEAL	25-A-74	22-A-21	25-A-74	1
7	SEAL RETAINER	25-A-76	25-A-76	25-A-76	1
8	SPRING, POPPET	25-A-77	25-A-77	25-A-77	1
9	END PLUG, POPPET	25-A-96	25-A-96	25-A-96	1
10	O-RING, END PLUG	00-24-2	00-24-2	00-24-2	1
11	PISTON ROD	22-A-79	22-A-79	22-A-79	1
12	SPRING, PISTON ROD	10-A-97	10-A-97	10-A-97	1
13	O-RING, BODY	0-014-1	0-014-1	0-014-1	1
14	BACK-UP RING	BU-014	BU-014	BU-014	1
15	O-RING, END PLUG	0-233-2	0-233-2	0-233-2	1
16	SOC HD CAP SCR	7/16-14 NC×7/8	7/16-14 NC×7/8	7/16-14 NC×7/8	4
17	POPPET SUB-ASS'Y	22-A-51	22-A-52	22-A-51	1

DIMENSION TABLE

MOD. NO.	LETTER A PORT	B PORT	C	D	E	F	G	H	J	K
-2000	1 1/4 NPTF	1 1/4 NPTF	6.75	8.65	3.87	2.71	.68	2.43	1.75	3.50
-2400	1 1/2 NPTF	1 1/2 NPTF	6.75	8.65	3.87	2.71	.68	2.43	1.75	3.50





J.I.C. SYMBOL

NOTES:

1. MODEL DESIGNATION:
   - CP: PILOT PRESS.- HYD. WORKING LINE-HYD.
   - ACP: PILOT PRESS.—AIR WORKING LINE-AIR
   - BACP: PILOT PRESS.—AIR WORKING LINE-HYD.
2. MATERIAL:
   - O-RINGS & PACKING: BUNA-N
   - POPPET SEAL: NYLON (HYD.) ; BUNA-N (AIR)
   - BACK-UP RING: TEFLON
   - BODY: STEEL
3. CRACKING PRESSURE IN FREE FLOW DIRECTION: CP & BACP-15 PSI, ACP-5 PSI
4. OTHER MATERIALS, PORT CONNECTIONS & CRACKING PRESSURE AVAILABLE
5. RECOMMENDED MAXIMUM WORKING PRESSURE IS 3,000 P.S.I.

LET.	CHANGES	DATE
C	PART NO. 11 WAS 10-A-83	3-24-64
B	DIM. "H" WAS 2.50	
A	WAS IN-LINE PORTING	9-23-63

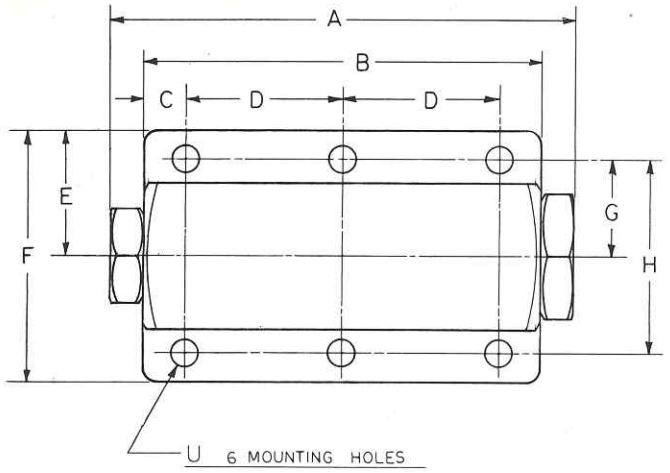
MANATROL
A DIVISION OF THE DERRY-FAY CO.
200 PERRY CT. ELYRIA, OHIO

SCALE: FULL
DATE: 4-12-63
APPROVED BY: E.S. 10-17-63
DRAWN BY: W.W.A.
REVISED

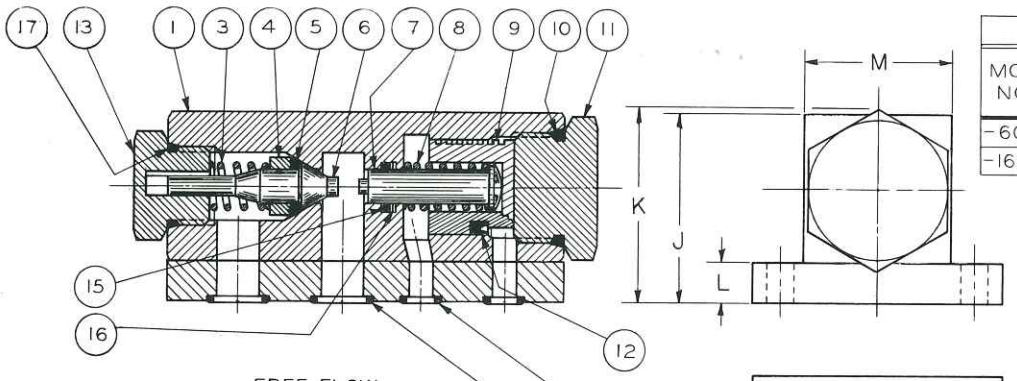
ASS'Y - PILOT OPERATED CHECK VALVE N.P.T.F. OFFSET PORTING, SIZE: 1 1/4-1 1/2

MODEL: CP, ACP & BACP SER.

DRAWING NUMBER: 203-C-93

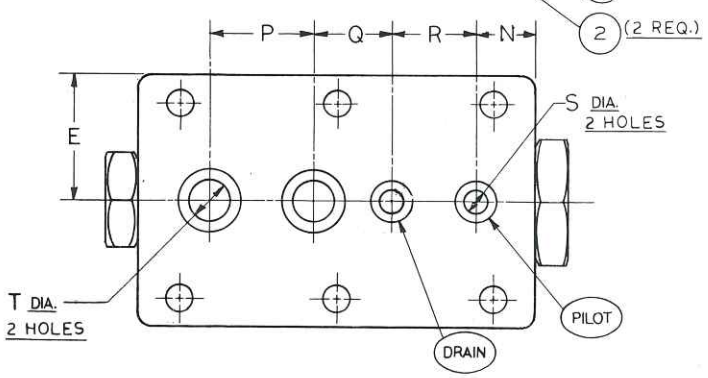


NO.	MODEL NO. → / DESCRIPTION	MANATROL PART NO. CPS-600	ACPS-600	BACPS-600	CPS-1600	ACPS-1600	BACPS-1600
1	BODY SUB-ASS'Y	4-B-128	4-B-128	4-B-128	25-B-90	25-B-90	25-B-90
2	O-RING, BODY	O-111-2	O-111-2	O-111-2	O-214-2	O-214-2	O-214-2
3	SPRING, POPPET	4-A-155	4-A-92	4-A-155	10-A-96	10-A-156	10-A-96
4	SEAL RETAINER	4-A-81	4-A-81	4-A-81	10-A-77	10-A-77	10-A-77
5	POPPET SEAL	4-A-80	4-A-100	4-A-80	10-A-78	10-A-95	10-A-78
6	POPPET	4-A-78	4-A-78	4-A-78	10-A-79	10-A-79	10-A-79
7	PISTON ROD	4-A-89	4-A-89	4-A-89	10-A-83	10-A-83	10-A-83
8	SPRING, PISTON	4-A-93	4-A-93	4-A-93	10-A-97	10-A-97	10-A-97
9	PISTON	4-B-79	4-B-86	4-B-86	10-A-82	10-A-86	10-A-86
10	O-RING	00-16-2	00-16-2	00-16-2	O-137-2	O-137-2	O-137-2
11	END PLUG, PISTON	204-16	204-16	204-16	10-A-128	10-A-128	10-A-128
12	PISTON PACKING		4-A-98	4-A-98		10-A-93	10-A-93
13	END PLUG, POPPET	4-A-97	4-A-97	4-A-97	10-A-92	10-A-92	10-A-92
14	O-RING	O-012-2	O-012-2	O-012-2	O-012-2	O-012-2	O-012-2
15	O-RING	O-012-1	O-012-1	O-012-1	O-014-1	O-014-1	O-014-1
16	BACK-UP RING	BU-012	BU-012	BU-012	BU-014	BU-014	BU-014
17	O-RING	00-10-2	00-10-2	00-10-2	00-16-2	00-16-2	00-16-2
18	POPPET SUB-ASS'Y	4-A-110	4-A-127	4-A-110	10-A-110	10-A-129	10-A-110

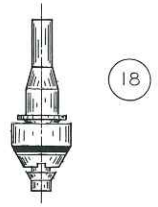


MOD. NO.	LETTER A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U
-600	5.48	4.75	.50	1.87	1.50	3.00	1.15	2.31	2.20	—	.45	1.75	.75	1.25	.90	1.00	.28	.40	.32
-1600	6.84	6.00	.62	2.37	1.93	3.87	1.59	3.18	3.17	3.39	.67	2.50	1.18	1.50	1.18	1.12	.28	.81	.39

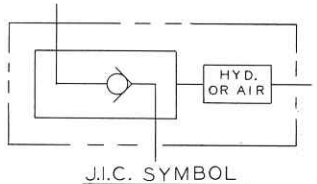
DIMENSION TABLE



2 STAGE POPPET SUB-ASS'Y
(AVAILABLE ON ALL MODELS)



PILOT TO POPPET RATIO-40:1



J.I.C. SYMBOL

NOTES:

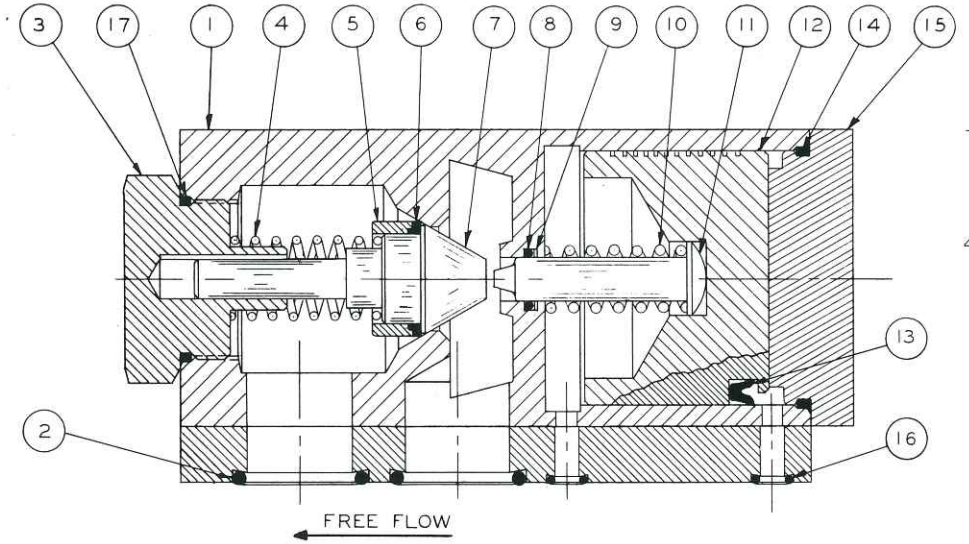
1. MODEL DESIGNATION:
   - CPS: PILOT----------HYD. / WORKING LINE-----HYD.
   - ACPS: PILOT----------AIR / WORKING LINE----AIR
   - BACPS: PILOT----------AIR / WORKING LINE----HYD.
2. MATERIAL:
   - O-RINGS & PACKING--- BUNA-N ; BACK-UP RING----TEFLON
   - POPPET SEAL--NYLON (HYD) & BUNA-N (AIR)
   - BODY ----------STEEL
3. CRACKING PRESSURE IN FREE FLOW DIRECTION---CPS & BACPS-15 PSI ; ACPS-5 PSI
4. OTHER MATERIALS & CRACKING PRESSURES AVAILABLE
5. RECOMMENDED MAXIMUM WORKING PRESSURE---3000 PSI

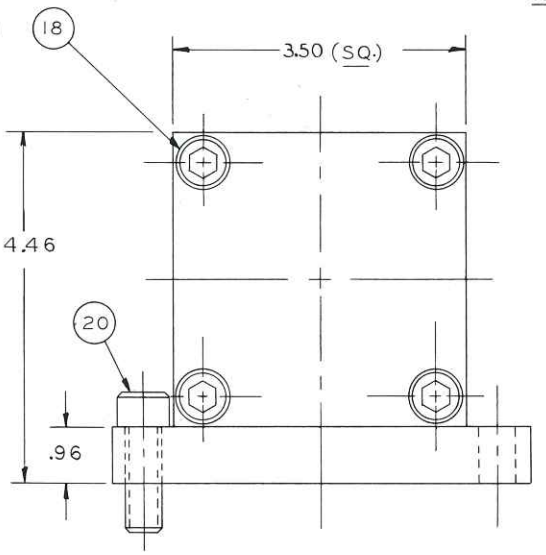
LET.	DATE	CHANGES	BY	CHK
A	10-17-63	"B" DIM. MODEL NO. DASH 600 WAS 4.48	WW .A	E.S.

MANATROL
A DIVISION OF THE PERRY-FAY CO.
200 PERRY CT. ELYRIA, OHIO

SCALE: —
DATE: 4-19-63
APPROVED BY E.S. 6-8-64
DRAWN BY DLS
REVISED

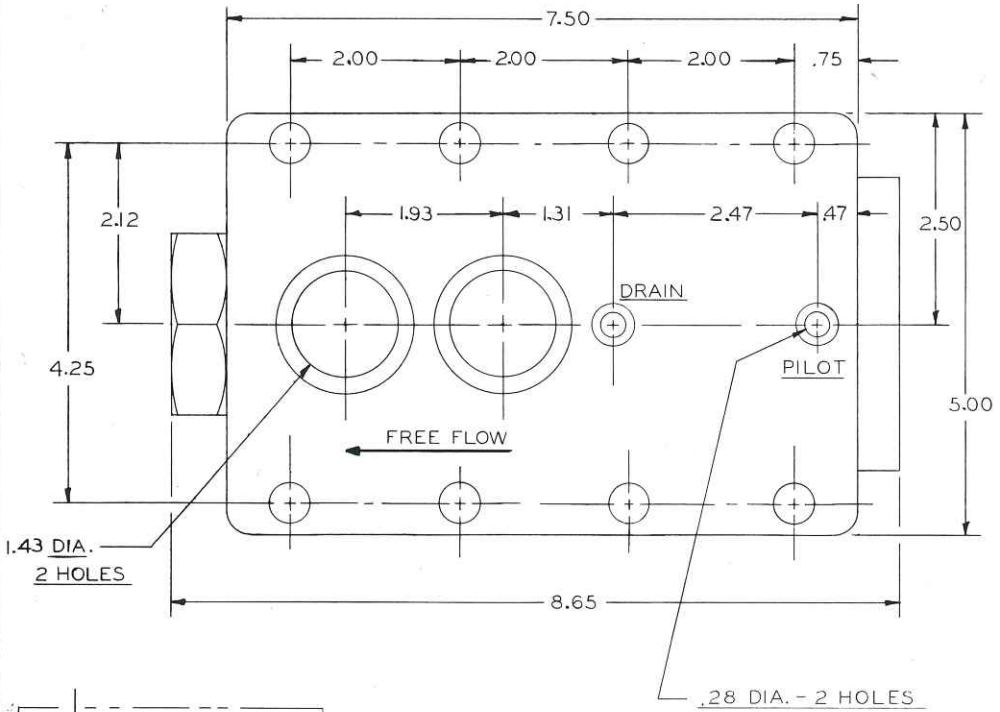
ASS'Y - PILOT OPERATED CHECK VALVE, SUB-PLATE MTG, SIZES: 3/8 & 1"
MODEL CPS, ACPS & BACPS
DRAWING NUMBER 203-C-99



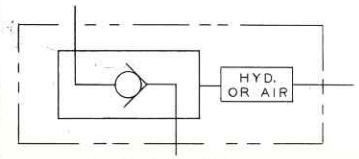


NOTES:

1. MODEL DESIGNATION:
   - CPS: PILOT PRESS. — HYD. WORKING LINE — HYD.
   - ACPS: PILOT PRESS. — AIR WORKING LINE — AIR
   - BACPS: PILOT PRESS. — AIR WORKING LINE — HYD.
2. MATERIAL:
   - O-RINGS & PACKING: BUNA-N
   - POPPET SEAL: NYLON (HYD.) : BUNA-N (AIR)
   - BACK-UP RING: TEFLON
   - BODY: STEEL
3. CRACKING PRESSURE IN FREE FLOW DIRECTION: CPS-15 PSI, ACPS - 5 PSI, BACPS - 15 PSI
4. OTHER MATERIALS AND CRACKING PRESS. AVAILABLE
5. RECOMMENDED MAXIMUM WORKING PRESSURE IS 3000 P.S.I.

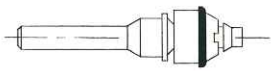


NO.	MODEL NO. → / DESCRIPTION	CPS-2400	ACPS-2400	BACPS-2400	NO. REQ.
1	BODY SUB-ASS'Y	26-B-21	26-B-21	26-B-21	1
2	O-RING BODY	0-222-1	0-222-1	0-222-1	2
3	END PLUG, POPPET	25-A-96	25-A-96	25-A-96	1
4	SPRING, POPPET	25-A-77	25-A-117	25-A-77	1
5	SEAL RETAINER	25-A-76	25-A-76	25-A-76	1
6	POPPET SEAL	25-A-74	22-A-21	25-A-74	1
7	POPPET	25-A-73	25-A-73	25-A-73	1
8	O-RING	0-014-1	0-014-1	0-014-1	1
9	BACK-UP RING	BU-014	BU-014	BU-014	1
10	SPRING, PISTON ROD	10-A-97	10-A-97	10-A-97	1
11	PISTON ROD	22-A-79	22-A-79	22-A-79	1
12	PISTON	25-B-70	25-B-71	25-B-71	1
13	PISTON PACKING		25-A-78	25-A-78	1
14	O-RING, END PLUG	0-233-2	0-233-2	0-233-2	1
15	END PLUG, PISTON	22-B-50	22-B-50	22-B-50	1
16	O-RING, BODY	0-012-2	0-012-2	0-012-2	2
17	O-RING, END PLUG	00-24-2	00-24-2	00-24-2	1
18	SOC. HD CAP SCREW	7/16-14NC × 7/8	7/16-14NC × 7/8	7/16-14NC × 7/8	4
19	POPPET SUB-ASS'Y	22-A-51	22-A-52	22-A-51	1
20	MOUNTING SCREWS	7/16-14NC × 1 1/2 SOC. HD. CAP SCR.	7/16-14NC × 1 1/2 SOC. HD. CAP SCR.	7/16-14NC × 1 1/2 SOC. HD. CAP SCR.	8



J.I.C. SYMBOL

2 STAGE POPPET SUB-ASS'Y
(AVAILABLE ON ALL MODELS)



PILOT TO POPPET RATIO 40:1

(SCALE: NONE)

LET.	DATE	CHANGES	BY	CHK
A	3-24-64	PART NO. 11 WAS 10-A-83	W.W.A.	E.S.

MANATROL
A DIVISION OF THE PERRY-FAY CO.
200 PERRY ST. ELYRIA, OHIO

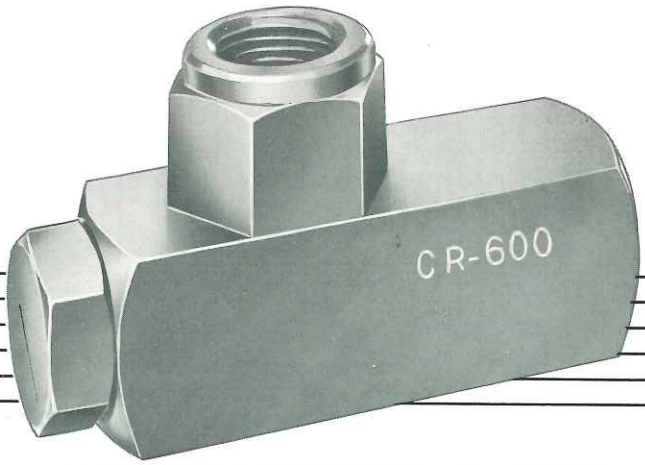
SCALE: FULL
DATE: 4-20-63
APPROVED BY: E.S. 6-10-64
DRAWN BY: W.W.A.
REVISED

ASS'Y - PILOT OPERATED CHECK VALVE, SUB-PLATE MOUNTED, SIZE: 1 1/2

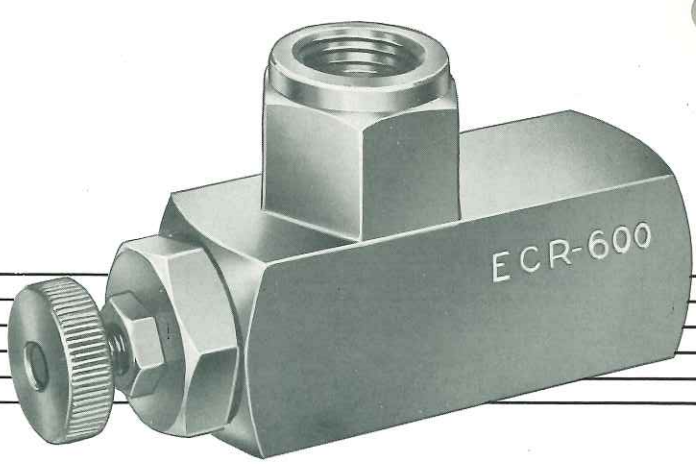
MODEL: CPS, ACPS & BACPS

DRAWING NUMBER: 203-C-98

CR AND ECR SERIES



MANATROL RELIEF VALVE CR SERIES
INTERNALLY ADJUSTABLE



MANATROL RELIEF VALVE ECR SERIES
EXTERNALLY ADJUSTABLE

The CR and ECR Series of Internally or Externally Adjustable Right-Angle, Steel Check Valves is an extremely versatile valve line. CR and ECR Valves can be used for pneumatic or hydraulic applications, as check valves with an adjustable cracking pressure, or as low-pressure relief or pop-off valves. The internally adjustable "CR" Valve can be used where tamper-proof installations are desirable.

The CR and ECR Valves are a series of direct spring relief valves using the guided poppet to assure proper alignment and prevent the poppet from cocking. This series incorporates a soft poppet seal to insure positive seating. These valves are available in a variety of compounds to insure compatibility with all fluids.

The valves are available with Dryseal pipe threads in 1/4" through 1 1/4". A wide range of springs are available for selective control of cracking pressures from 0 to 400 PSI.

HOW TO ORDER

Example: ECR - 800 - 6 **(This is an externally adjustable relief valve with ½ inch NPTF ports and having a pressure range of 55 to 100 psi.)**

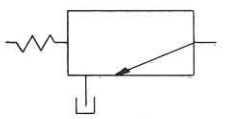
SERIES
CR = Internal Adjustment.
ECR = External Adjustment.

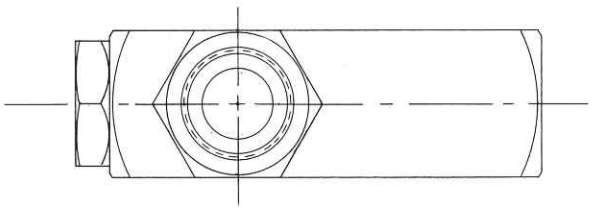
SIZE
4 = 1/4"
6 = 3/8"
8 = 1/2"
12 = 3/4"
16 = 1"
20 = 1 1/4"

THREAD STYLE
00 = NPTF
10 = AND 10050

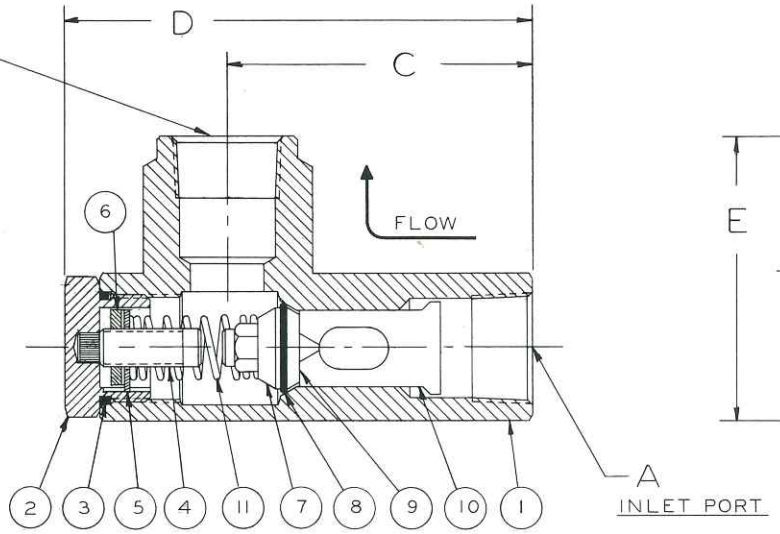
PRESSURE RANGE
2 = 5 - 20 psi.
4 = 15 - 60 psi.
6 = 55 - 100 psi.
8 = 90 - 150 psi.
10 = 140 - 250 psi.
12 = 240 - 400 psi.

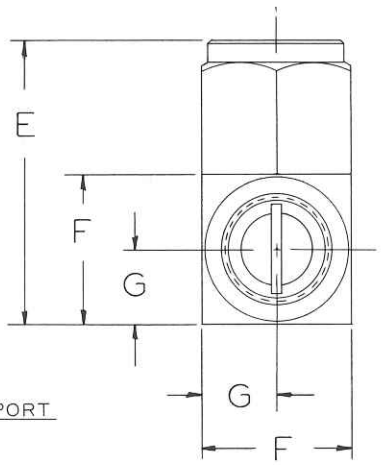
J.I.C. SYMBOL





DIMENSION TABLE							
MOD. NO.	LETTER						
	A PORT	B PORT	C	D	E	F	G
-400	1/4 NPTF	1/4 NPTF	1.62	2.79	1.48	.81	.40
-600	3/8 NPTF	3/8 NPTF	1.78	3.06	1.75	1.00	.50
-800	1/2 NPTF	1/2 NPTF	2.15	3.50	2.09	1.25	.56
-1200	3/4 NPTF	3/4 NPTF	2.71	4.50	2.50	1.50	.75
-1600	1" NPTF	1" NPTF	3.45	5.40	3.37	1.75	.87
-2000	1 1/4 NPTF	1 1/4 NPTF	4.46	6.90	3.89	2.25	1.12





NOTES:
1. MATERIAL:
   O-RING AND SEAL:
   BUNA-N (STEEL VALVE)
   VITON (ST'N. ST'L VALVE)
   BODY: SEE MATERIAL TABLE
2. OTHER MATERIALS & PORT CONNECTIONS AVAILABLE

MATERIAL TABLE	
*	BODY MATERIAL
-S	STEEL B 1113
-SS	303 ST'N. ST'L
-SS6	316 ST'N. ST'L

CHART A
RECOMMENDED SETTING SPAN

DASH NO.	RANGE P.S.I.
-2	5 TO 20
-4	15 TO 60
-6	55 TO 100
-8	90 TO 150
-10	140 TO 250
-12	240 TO 400

DESCRIPTION		MANATROL PART NO.					
NO.	MODEL NO. →	CR-400	CR-600	CR-800	CR-1200	CR-1600	CR-2000
1	BODY	1-A-194	4-A-153	7-A-94	10-A-154	25-A-115	22-A-77
2	END PLUG	1-A-33	4-A-38	7-A-32	10-A-31	25-A-38	22-A-11
3	O-RING	00-6-2	00-8-2	00-10-2	00-12-2	00-16-2	00-24-2
4	STOP ROD	1-A-88	4-A-43	7-A-35	10-A-36	25-A-28	22-A-19
5	BEARING WASHER	1-A-101	4-A-58	7-A-46	10-A-46	25-A-35	22-A-28
6	SPRING ADJ. NUT	1-A-89	4-A-44	7-A-36	10-A-37	25-A-29	25-A-29
7	POPPET	1-A-6	4-A-11	7-A-11	10-A-11	25-A-2	22-A-16
8	POPPET SEAL	1-A-28	4-A-31	7-A-27	10-A-25	25-A-17	22-A-21
9	POPPET RETAINER	1-A-10	4-A-12	7-A-12	10-A-12	25-A-13	22-A-12
10	GUIDE BLADE	1-A-40	4-A-129	7-A-75	10-A-133	25-A-93	22-A-55
11	SPRING: 5 PSI-20 PSI	1-A-96	4-A-54	7-A-42	10-A-42	25-A-31	22-A-23
	15 PSI-60 PSI	1-A-97	4-A-55	7-A-43	10-A-43	25-A-32	22-A-24
	55 PSI-100 PSI	1-A-98	4-A-56	7-A-44	10-A-44	25-A-33	22-A-25
	90 PSI-150 PSI	1-A-99	4-A-57	7-A-45	10-A-45	25-A-34	22-A-26
	140 PSI-250 PSI	1-A-191	4-A-148	7-A-90	10-A-150	25-A-111	22-A-73
	240 PSI-400 PSI	1-A-192	4-A-149	7-A-91	10-A-151	25-A-112	22-A-74

LET.	DATE	CHANGES	BY	CHK
E	9-16-63	REDRAWN AND REVISED	W.W.A.	E.S.

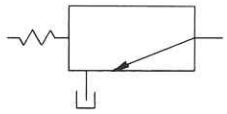
MANATROL
A DIVISION OF THE PERRY-FAY CO.
200 PERRY CT. ELYRIA, OHIO

SCALE: NONE
DATE: 9-16-63
APPROVED BY E.S. 6-9-64
DRAWN BY W.W.A.
REVISED

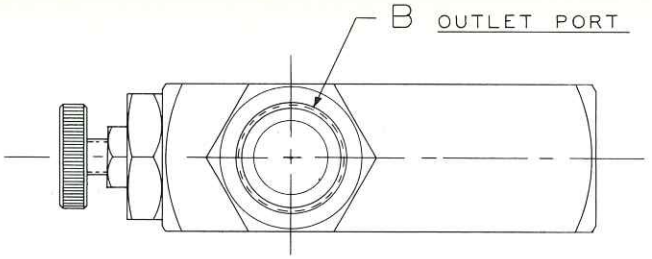
ASS'Y - RIGHT ANGLE CHECK & RELIEF VALVE WITH ADJ. CRACKING PRESS., NPTF PORTS, SIZES: 1/4-1 1/4

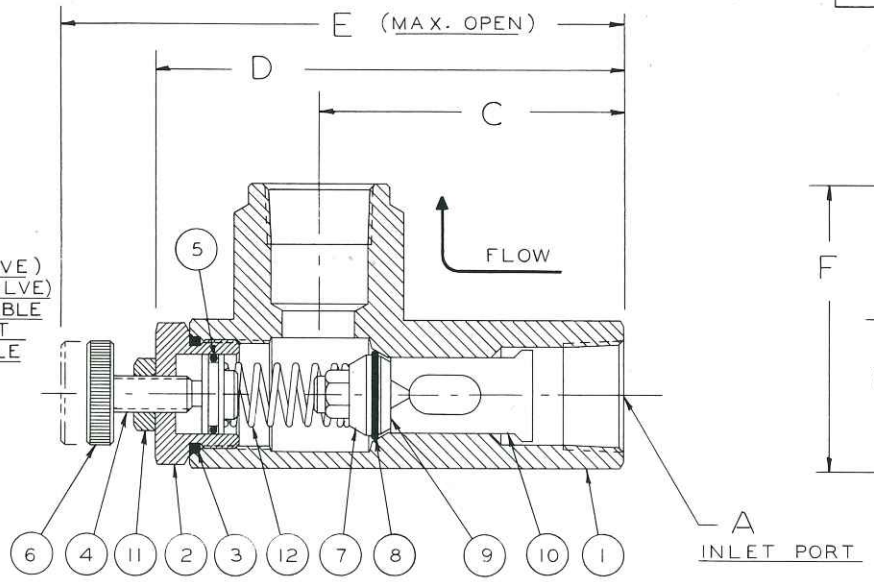
MODEL: "CR" SERIES

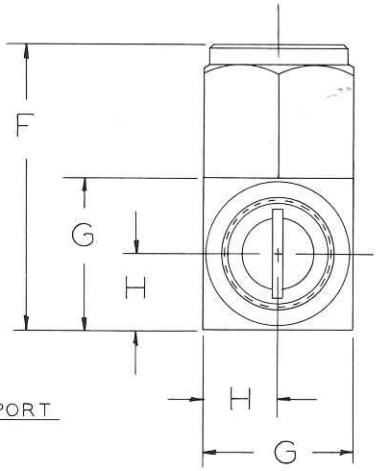
DRAWING NUMBER 203-C-8



J.I.C. SYMBOL







NOTES:
1. MATERIAL:
   O-RINGS AND SEAL:
   BUNA-N (STEEL VALVE)
   VITON (ST'N. ST'L VALVE)
   BODY: SEE MATERIAL TABLE
2. OTHER MATERIALS & PORT CONNECTIONS AVAILABLE

DIMENSION TABLE

MOD. NO.	LETTER							
	A PORT	B PORT	C	D	E	F	G	H
-400	1/4 NPTF	1/4 NPTF	1.62	2.79	3.60	1.48	.81	.40
-600	3/8 NPTF	3/8 NPTF	1.78	3.06	3.92	1.75	1.00	.50
-800	1/2 NPTF	1/2 NPTF	2.15	3.50	4.39	2.09	1.25	.56
-1200	3/4 NPTF	3/4 NPTF	2.71	4.50	5.51	2.50	1.50	.75
-1600	1" NPTF	1" NPTF	3.45	5.42	6.56	3.37	1.75	.87
-2000	1 1/4 NPTF	1 1/4 NPTF	4.46	6.67	8.04	3.89	2.25	1.12

MATERIAL TABLE

*	BODY MATERIAL
-S	STEEL B1113
-SS	303 ST'N. ST'L
-SS6	316 ST'N. ST'L

CHART A
RECOMMENDED SETTING SPAN

DASH NO.	RANGE P.S.I.
-2	5 TO 20
-4	15 TO 60
-6	55 TO 100
-8	90 TO 150
-10	140 TO 250
-12	240 TO 400

NO.	DESCRIPTION: MODEL NO. →	MANATROL PART NO. ECR-400	ECR-600	ECR-800	ECR-1200	ECR-1600	ECR-2000
1	BODY	1-A-194	4-A-153	7-A-94	10-A-154	25-A-115	22-A-77
2	END PLUG	1-A-116	4-A-70	7-A-50	10-A-65	25-A-40	22-A-33
3	O-RING, END PLUG	00-6-2	00-8-2	00-10-2	00-12-2	00-16-2	00-24-2
4	ADJUSTMENT SCR	1-A-115	4-A-59	7-A-49	10-A-64	25-A-39	22-A-32
5	O-RING	0-010-1	0-011-1	0-013-1	0-112-1	0-116-1	0-122-1
6	ADJUSTMENT KNOB	4-A-60	4-A-60	7-A-52	7-A-52	25-A-42	25-A-42
7	POPPET	1-A-6	4-A-11	7-A-11	10-A-11	25-A-2	22-A-16
8	POPPET SEAL	1-A-28	4-A-31	7-A-27	10-A-25	25-A-17	22-A-21
9	POPPET RETAINER	1-A-10	4-A-12	7-A-12	10-A-12	25-A-13	22-A-12
10	GUIDE BLADE	1-A-40	4-A-129	7-A-75	10-A-133	25-A-93	22-A-55
11	LOCKNUT	1-A-117	1-A-117	7-A-51	7-A-51	25-A-41	25-A-41
12	SPRING: 5 PSI-20PSI	1-A-96	4-A-54	7-A-42	10-A-42	25-A-31	22-A-23
	15 PSI — 60 PSI	1-A-97	4-A-55	7-A-43	10-A-43	25-A-32	22-A-24
	55 PSI-100 PSI	1-A-98	4-A-56	7-A-44	10-A-44	25-A-33	22-A-25
	90 PSI-150 PSI	1-A-99	4-A-57	7-A-45	10-A-45	25-A-34	22-A-26
	140 PSI-250 PSI	1-A-191	4-A-148	7-A-90	10-A-150	25-A-111	22-A-73
	240 PSI-400 PSI	1-A-192	4-A-149	7-A-91	10-A-151	25-A-112	22-A-74

LET.	DATE	CHANGES	BY	CHK
C	9-12-63	REDRAWN AND REVISED	W WA	E.S.

MANATROL
A DIVISION OF THE PERRY-FAY CO.
200 PERRY CT. ELYRIA, OHIO

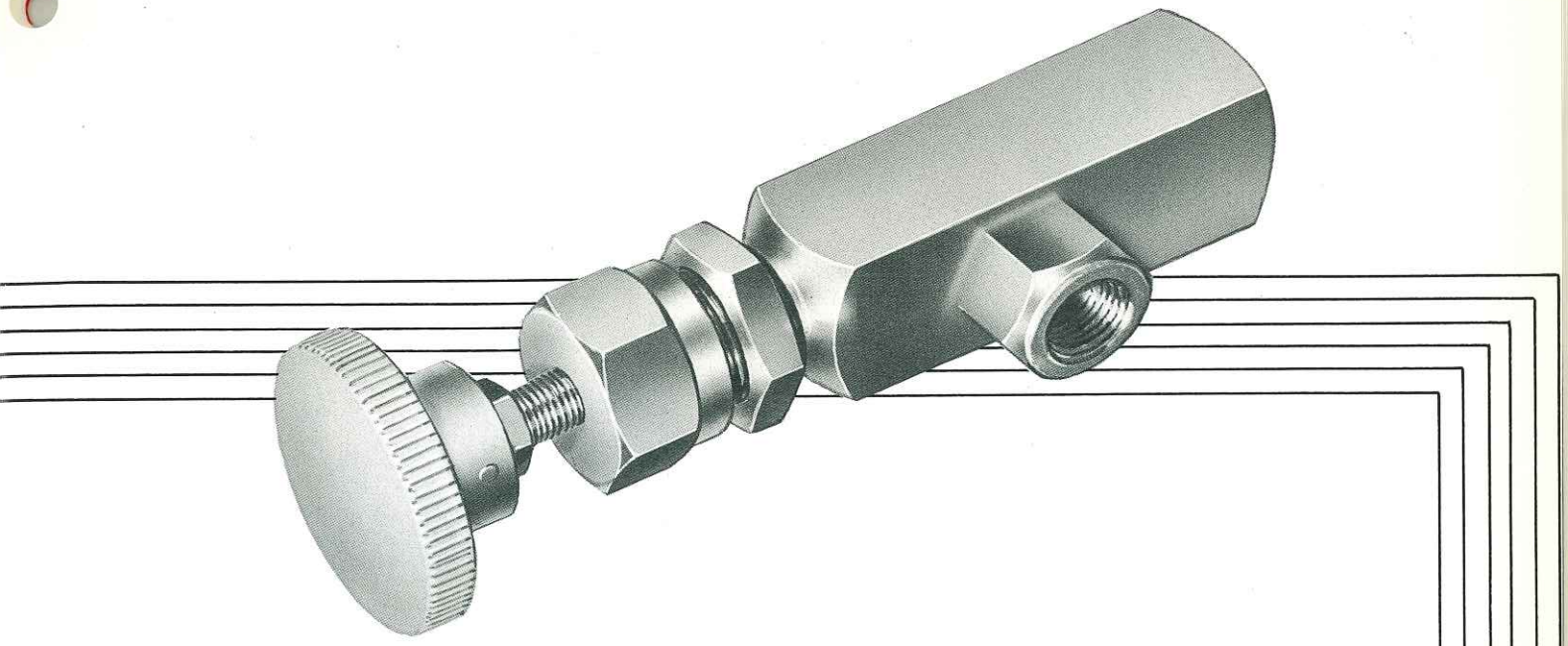
SCALE: NONE
DATE: 9-12-63
APPROVED BY E.S. 6-10-64
DRAWN BY W.W.A.
REVISED

ASS'Y—RIGHT ANGLE CHECK & RELIEF VALVE WITH EXT. ADJ., SIZES: 1/4-1 1/4

MODEL: "ECR" SERIES

DRAWING NUMBER 203-C-16

RA SERIES



MANATROL RELIEF VALVE RA SERIES

The "RA" Series Relief Valves are used to control the maximum pressure in a circuit. These rugged, all steel valves are available to control pressure from 0 to 5000 PSI.

This series is a direct spring actuated valve using a guided poppet to prevent any cocking or misalignment. The operation is such that when the line pressure equals the opposing force provided by the spring on the poppet the valve opens, by-passing to tank, sufficient oil to maintain the pre-determined system pressure.

As a panel mounting feature, a rugged jam nut is provided on all "RA" Valves.

RA Valves with the -1 and -2 spring ranges are equipped with a strong, molded bakelite adjusting knob. Valves with the -3, -4, and -5 spring ranges utilize a socket head cap screw as an adjusting mechanism. They are available with Dryseal pipe threads in sizes ranging from ¼ inch through ¾ inch.

HOW TO ORDER

EXample: RA - 600 - 2 **(This is a Manatrol relief valve with ⅜ NPTF ports having a range of 250 to 750 PSI.)**

SIZE

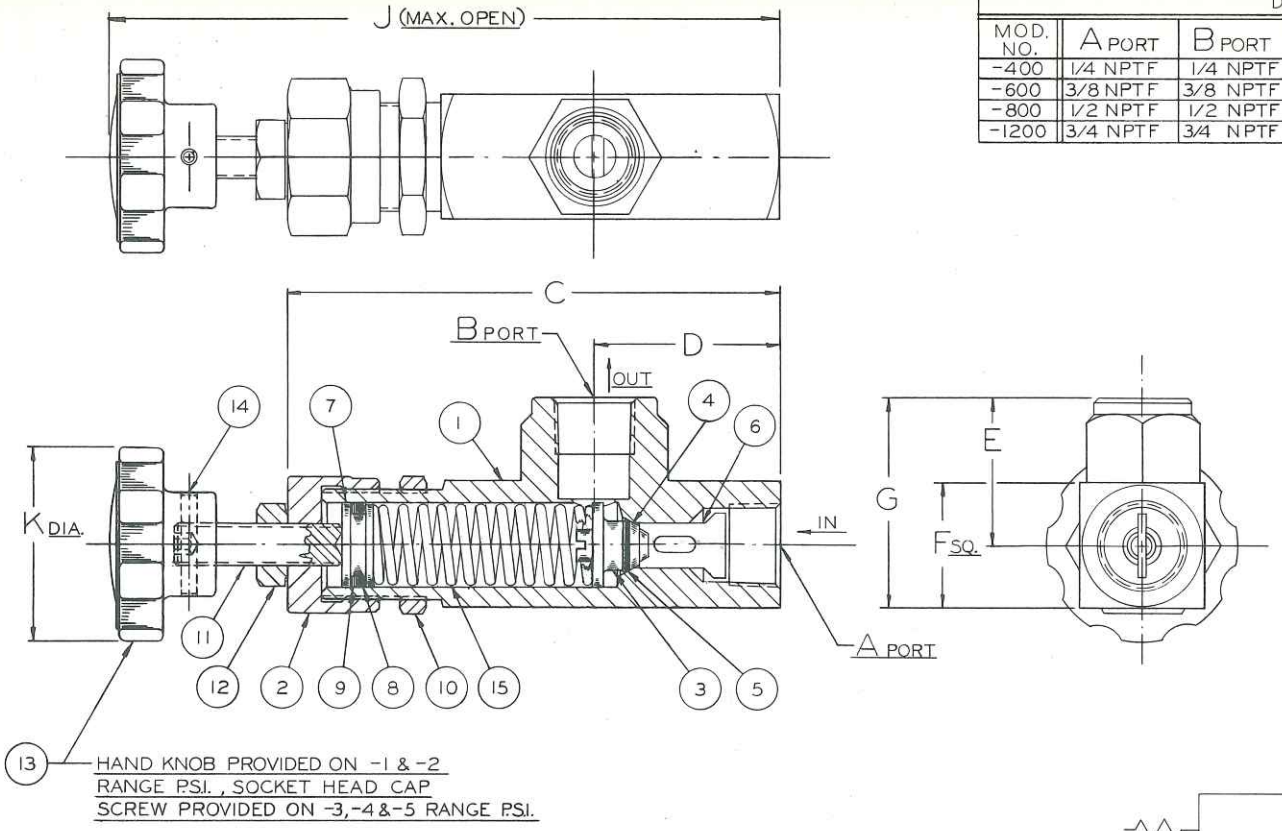
4 = ¼"
6 = ⅜"
8 = ½"
12 = ¾"

THREAD STYLE

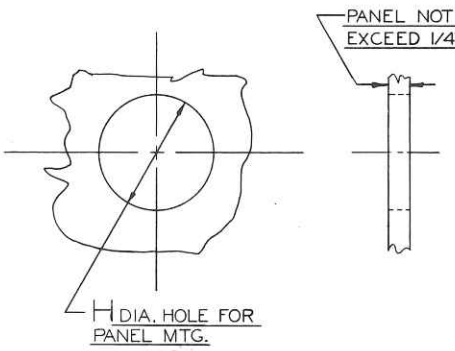
00 = NPTF
10 = AND 10050

PRESSURE RANGE

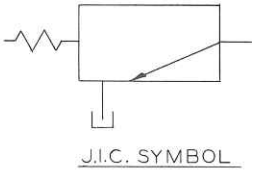
1 = 0 - 350 psi.
2 = 250 - 750 psi.
3 = 600 - 1200 psi.
4 = 1000 - 2200 psi.
5 = 2000 - 3000 psi.



DIMENSION TABLE										
MOD. NO.	A PORT	B PORT	C	D	E	F SQ.	G	H DIA.	J	K DIA.
-400	1/4 NPTF	1/4 NPTF	4.25	1.65	1.17	1.00	1.67	.90	6.18	1.87
-600	3/8 NPTF	3/8 NPTF	4.25	1.65	1.25	1.00	1.75	.90	6.18	1.87
-800	1/2 NPTF	1/2 NPTF	5.92	2.21	1.57	1.50	2.32	1.34	8.81	2.37
-1200	3/4 NPTF	3/4 NPTF	5.92	2.21	1.75	1.50	2.50	1.34	8.81	2.37



MATERIAL TABLE	
*	BODY MATERIAL
-S	STEEL B-1113
-SS	303 ST'N. ST'L.
-SS6	316 ST'N. ST'L.



DESCRIPTION		MANATROL PART NO.			
NO.	MODEL NO. →	RA-400	RA-600	RA-800	RA-1200
1	BODY	1-B-189	4-B-146	7-B-88	10-B-148
2	END CAP	1-A-38	1-A-38	10-B-49	10-B-49
3	POPPET	1-A-105	1-A-105	10-A-48	10-A-48
4	POPPET RETAINER	1-A-36	1-A-36	7-A-12	7-A-12
5	POPPET SEAL	1-A-120	1-A-120	10-A-75	10-A-75
6	GUIDE BLADE	1-A-40	1-A-40	7-A-75	7-A-75
7	PISTON	1-A-41	1-A-41	10-A-50	10-A-50
8	O-RING, PISTON	O-111-1	O-111-1	O-210-1	O-210-1
9	BACK-UP RING, PISTON	BU-111	BU-111	BU-210	BU-210
10	PANEL NUT	1-A-82	1-A-82	10-A-61	10-A-61
11	ADJ. SCREW	1-A-107	1-A-107	10-A-56	10-A-56
12	FIN. HEX. JAM NUT	3/8-24 NF	3/8-24 NF	1/2-20 NF	1/2-20 NF
13	HAND KNOB	1-A-106	1-A-106	10-A-55	10-A-55
14	ROLL PIN	1/8 DIA × 1"	1/8 DIA. × 1"	1/8 DIA × 1 1/4	1/8 DIA. × 1 1/4
15	SPRING: 0 P.S.I - 350 P.S.I.	1-A-122	1-A-122	10-A-70	10-A-70
	250 P.S.I. - 750 P.S.I.	1-A-123	1-A-123	10-A-71	10-A-71
	600 P.S.I. - 1200 P.S.I.	1-A-124	1-A-124	10-A-72	10-A-72
	1000 P.S.I. - 2200 P.S.I.	1-A-125	1-A-125	10-A-73	10-A-73
	2000 P.S.I. - 3000 P.S.I.	1-A-126	1-A-126	10-A-74	10-A-74

NOTES:
1. MATERIAL:
   O-RING: BUNA-N (STEEL VALVE)
   VITON (ST'N. ST'L. VALVE)
   POPPET SEAL — NYLON
   BACK-UP RING: TEFLON
   BODY: SEE MATERIAL TABLE
2. OTHER MATERIALS & PORT CONNECTIONS AVAILABLE.

CHART "A" RECOMMENDED SETTING SPAN	
DASH NO.	RANGE P.S.I.
-1	0-350
-2	250 - 750
-3	600 - 1200
-4	1000 - 2200
-5	2000 - 3000

LET.	CHANGES	DATE
D	REDRAWN, REVISED & ADDED 1/2" & 3/4" SIZES	8/30/63

MANATROL
A DIVISION OF THE PERRY-FAY CO.
200 PERRY CT. ELYRIA, OHIO

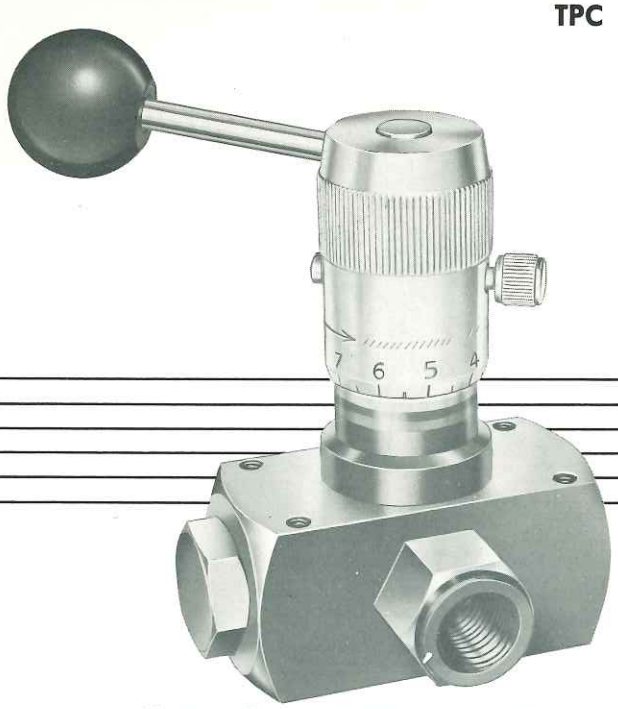
SCALE: ∞ | APPROVED BY M. Fay 8-29-63 | DRAWN BY KBT
DATE: 8/28/63 | REVISED

ASS'Y - RELIEF VALVE, RIGHT ANGLE, EXTERNALLY ADJUSTABLE, SIZES: 1/4-3/4

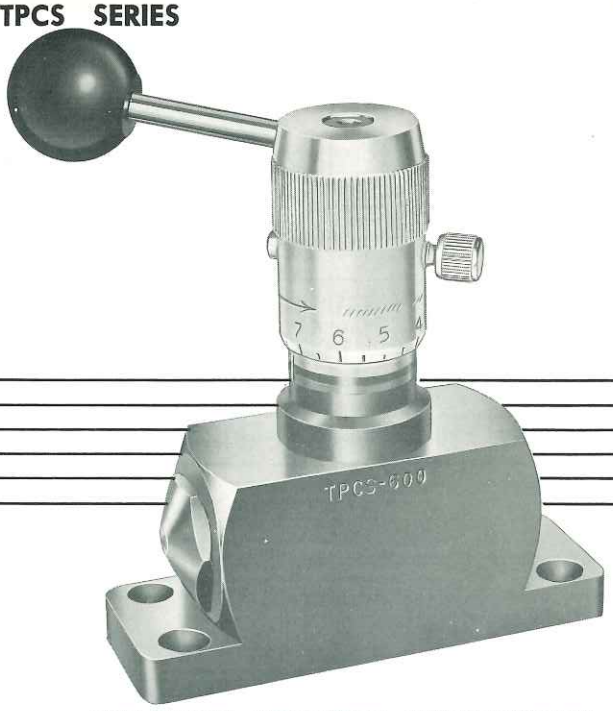
MODEL: "RA" SERIES | DRAWING NUMBER 203-C-15

MANATROL TEMPERATURE PRESSURE COMPENSATED FLOW CONTROL VALVES

TPC AND TPCS SERIES



LINE MOUNTED TEMPERATURE PRESSURE COMPENSATED FLOW CONTROL VALVE — TPC SERIES



SUB-PLATE MOUNTED TEMPERATURE PRESSURE COMPENSATED FLOW CONTROL VALVE — TPCS SERIES

Manatrol TPC and TPCS Flow Control Valves offer a controlled flow which is virtually unaffected by variations in fluid temperature or pressure and guaranteed to $\pm 2\frac{1}{2}\%$ variation with a Δ T of 60°F and $\pm 1\%$ variation over a Δ P of 3000 PSI.

These flow control valves employ a unique sharp-edged orifice which permits exceptionally fine control and allows the valve to compensate over a wide temperature differential.

Manatrol Temperature Pressure Compensated Flow Control Valves feature the exclusive Color-Coding Adjusting Scale which allows the valve to be adjusted, set, and re-set to a pre-determined flow rate by even the most inexperienced personnel. A locking thumb screw is provided so that the needle can be locked in any position desired.

ALL MANATROL TPCC AND TPCCS VALVES SHUT OFF

Valves are available in $\frac{3}{8}$ and $\frac{3}{4}$ inch sizes, line or sub-plate mounted models and with flow rates of 0 to 6 GPM in the $\frac{3}{8}$ inch and 0 to 25 GPM in the $\frac{3}{4}$ inch.

HOW TO ORDER

Example: TPC - 600 - 02 **(This is a line mounted, temperature pressure compensated flow control valve with $\frac{3}{8}$ NPTF ports, having a flow rate of 0 to 50 CIPM.)**

SERIES

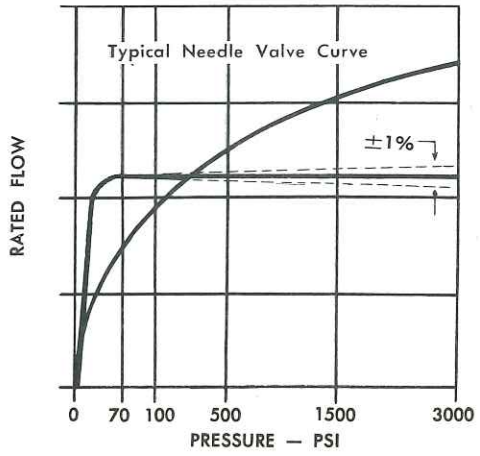
TPC = Temp., Pres. Comp. Valve, Line Mounted
TPCS = Temp., Pres. Comp. Valve, Sub Plate Mounted

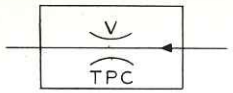
SIZE

6 = $\frac{3}{8}$"
12 = $\frac{3}{4}$"

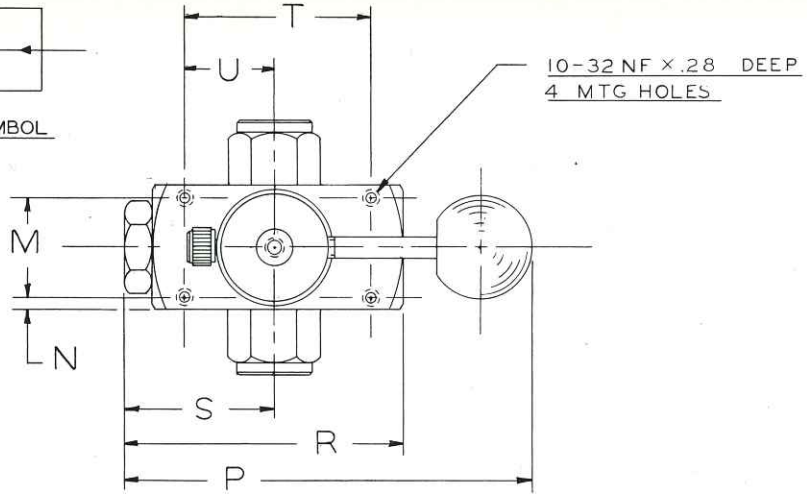
FLOW RATE

01 = 0 - 25 CIPM
02 = 0 - 50 CIPM
06 = 0 - 140 CIPM
3 = 0 - 3 GPM
6 = 0 - 6 GPM
*25 = 0 - 25 GPM
* in $\frac{3}{4}$" only

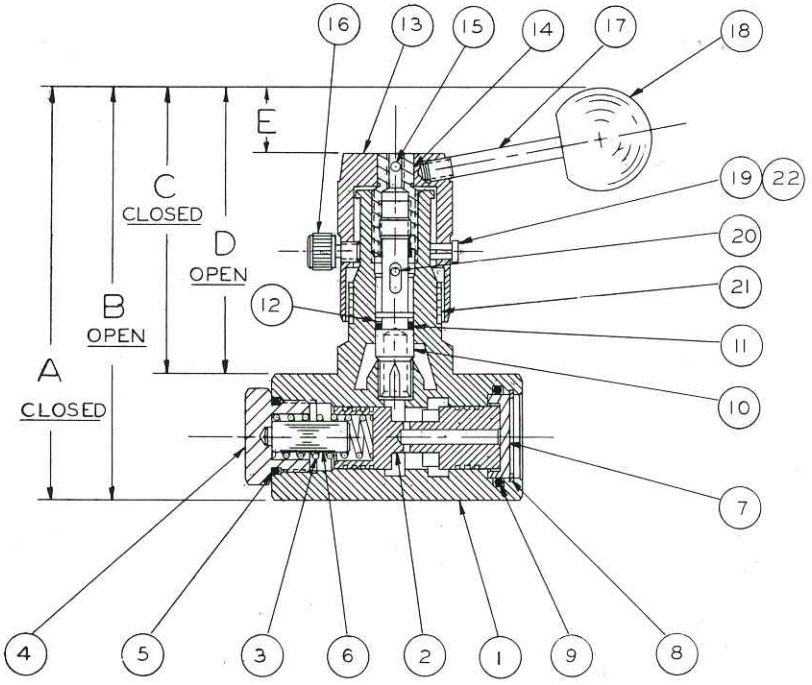


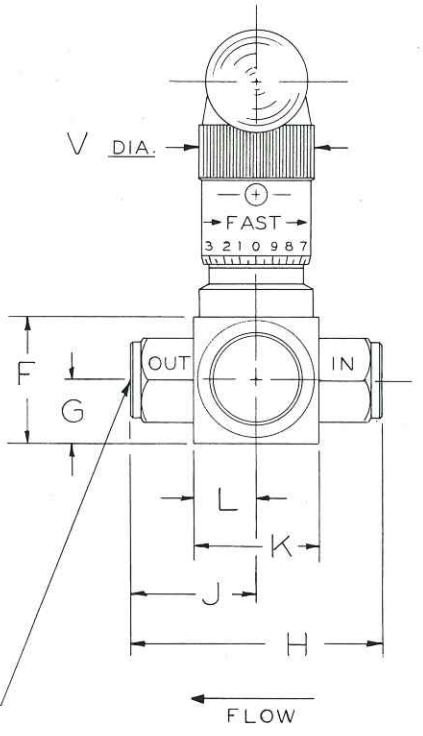


JIC SYMBOL



DIM. TABLE	
LET.	DIM.
A	4.84
B	5.34
C	3.34
D	3.84
E	.75
F	1.50
G	.75
H	3.00
J	1.50
K	1.50
L	.75
M	1.18
N	.15
P	4.81
R	3.31
S	1.81
T	2.25
U	1.12
V	1.37





NO.	PART NO.	DESCRIPTION	NO. REQ.
1	58-B-71	BODY	1
2	58-B-6	PISTON	1
3	58-A-16	SPRING, PISTON	1
4	204-10	END PLUG	1
5	00-10-2	O-RING, END PLUG	1
6	58-A-17	STOP ROD	1
7	58-A-34	END CAP	1
8	58-A-35	RETAINING RING	1
9	0-120-2	O-RING, BODY	1
10	CHART "A"	ORIFICE ACTUATOR	1
11	0-011-1	O-RING	1
12	BU-011	BACK-UP RING	1
13	58-B-10	KNOB	1
14	58-A-48	ACTUATOR-OUTER	1
15	58-A-54	LOCK PIN, ACTUATOR	1
16	58-A-15	LOCKSCREW	1
17	58-A-27	ROD, HANDLE	1
18	58-A-40	BALL, HANDLE	1
19	58-A-22	LOCKPIN, KNOB	1
20	58-A-55	PIN, ACTUATOR	1
21	10-A-7	MARKING WASHER	6
22	8-32 NC×1/4	SOC SET SCREW	1

CHART A
NEEDLE SPECIFICATION

FLOW RATE		NEEDLE	MODEL NO.
CU. IN./MIN.	G.P.M.	PART NO.	
⊛ 0-25	0.1	58-A-59	-600-01
⊛ 0-50	0.2	58-A-58	-600-02
0-140	0.6	58-A-49	-600-06
0-700	3.0	58-A-56	-600-3
0-1400	6.0	58-A-57	-600-6

NOTES:
1. MATERIAL:
   O-RINGS — BUNA "N"
   BACK-UP RING — TEFLON
   BODY — STEEL
2. OTHER MATERIALS AND PORT CONNECTIONS AVAILABLE
3. COMPENSATING PRESSURE FROM 70 PSI TO 3,000 PSI
⊛ 4. A 5 MICRON FILTER IS REQUIRED FOR THESE VALVE

LET	DATE	CHANGES	BY	CHK
A	6-2-64	REVISED TO LATEST DETAILS	W.W.A.	E.S.

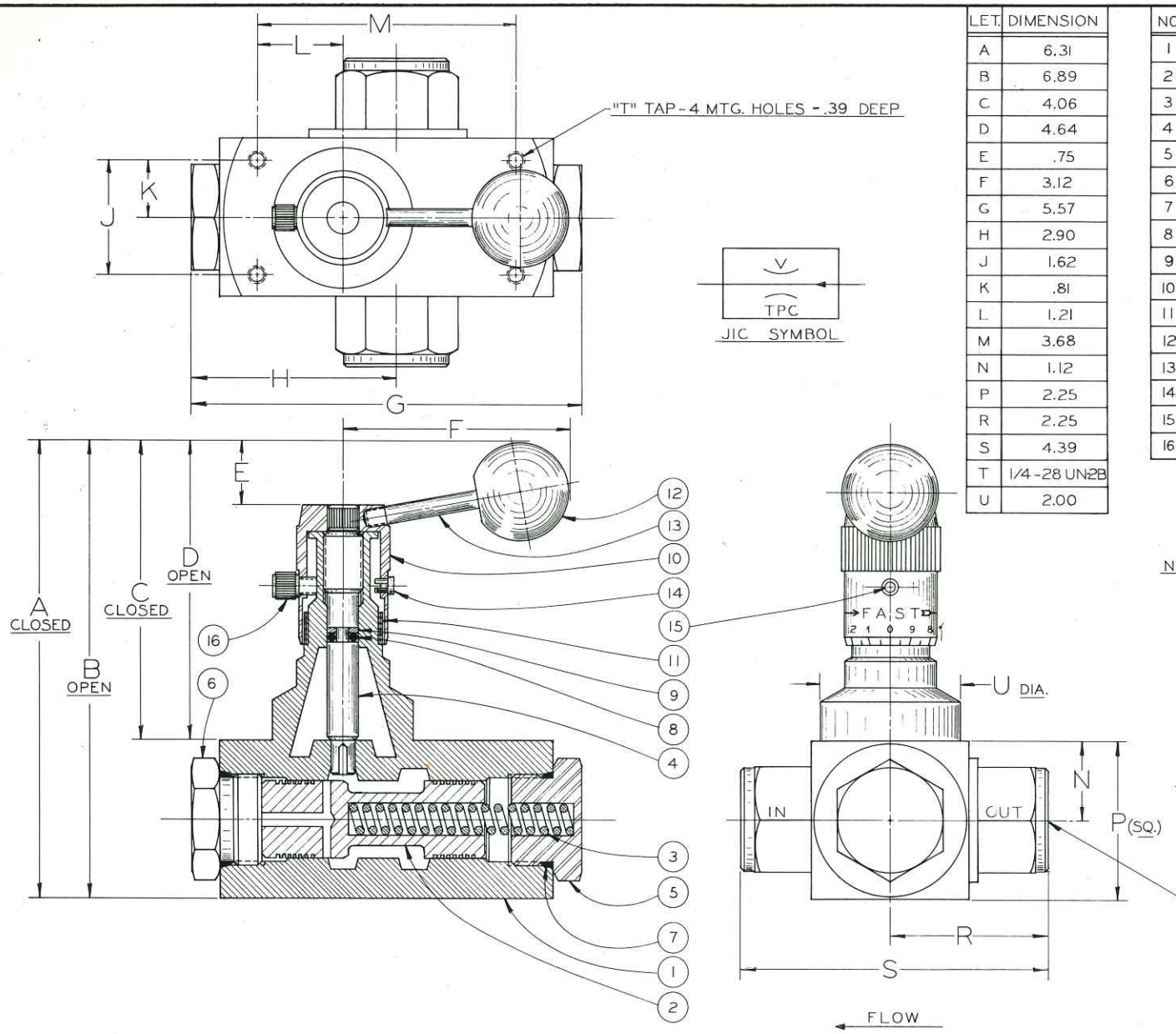
MANATROL
A DIVISION OF THE PERRY-FAY CO.
200 PERRY CT. ELYRIA, OHIO

SCALE: FULL
DATE: 4-1-63
APPROVED BY E.S. 6-11-64
DRAWN BY W.W.A.
REVISED

ASS'Y - TEMPERATURE PRESSURE COMPENSATED FLOW CONTROL VALVE

MODEL: TPC-600

DRAWING NUMBER 203-C-88



LET.	DIMENSION
A	6.31
B	6.89
C	4.06
D	4.64
E	.75
F	3.12
G	5.57
H	2.90
J	1.62
K	.81
L	1.21
M	3.68
N	1.12
P	2.25
R	2.25
S	4.39
T	1/4-28 UN-2B
U	2.00

NO.	DESCRIPTION	PART NO.	QTY.
1	BODY	59-B-38	1
2	PISTON	59-B-2	1
3	SPRING, PISTON	59-A-26	1
4	NEEDLE	59-B-32	1
5	END PLUG	59-A-37	1
6	END PLUG	10-A-92	1
7	O-RING, END PLUG	00-16-2	2
8	O-RING, NEEDLE	0-011-1	1
9	BACK-UP RING, NEEDLE	BU-011	1
10	KNOB	58-B-10	1
11	MARKING WASHER	10-A-7	6
12	HANDLE KNOB	58-A-40	1
13	HANDLE ROD	58-A-27	1
14	LOCKPIN, KNOB	58-A-22	1
15	SETSCREW	8-32 NC x 1/4	1
16	LOCKSCREW	58-A-15	1

NOTES:

1. FLOW RATE, 0 - 25 G.P.M.
2. MATERIAL:
   - O-RINGS ----------BUNA "N"
   - BACK-UP RING------TEFLON
   - BODY----------STEEL
3. OTHER MATERIALS AND PORT CONNECTIONS AVAILABLE
4. COMPENSATING PRESSURE FROM 70 P.S.I. TO 3000 P.S.I.

3/4 NPTF-2 PORTS

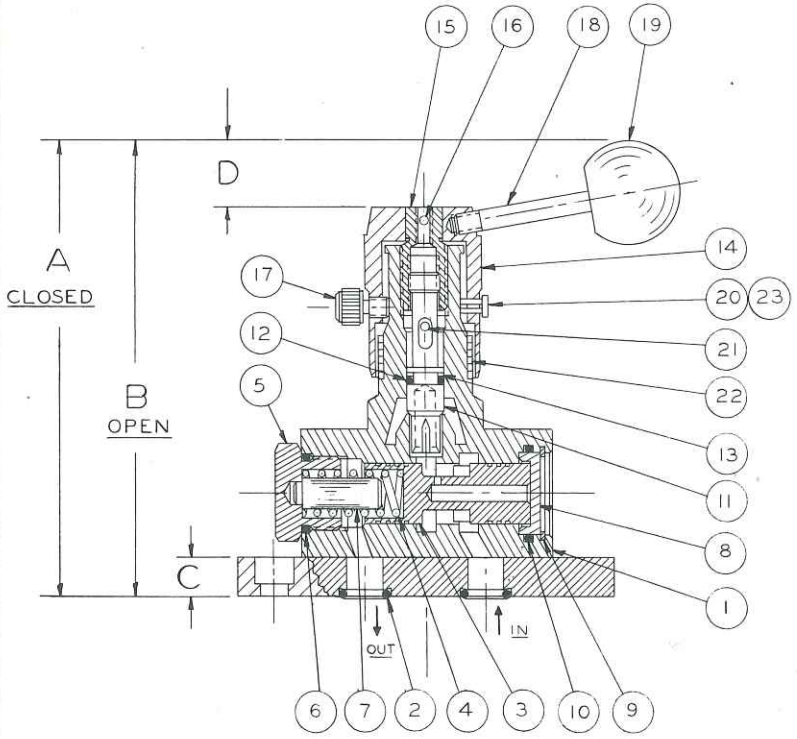
MANATROL
A DIVISION OF THE PERRY-FAY CO.
200 PERRY CT. ELYRIA, OHIO

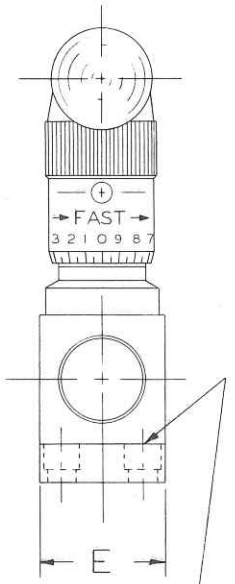
SCALE: 1/1
DATE: 4-6-64
APPROVED BY: [illegible] 8-7-64
DRAWN BY: DLS
REVISED:

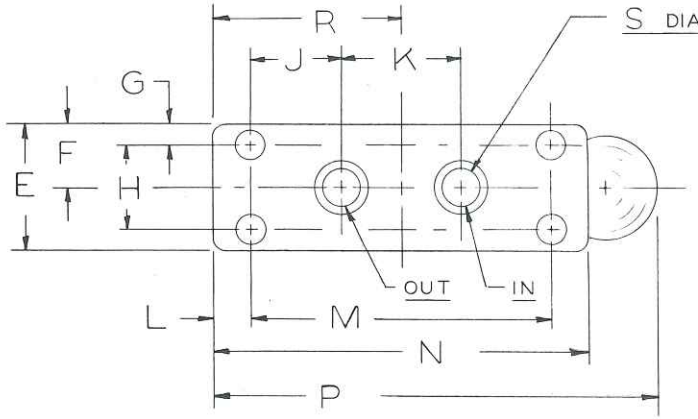
ASSY - TEMPERATURE PRESSURE COMPENSATED FLOW CONTROL VALVE, 3/4 NPTF PORTS, SIZE 3/4

MODEL : TPC-1200

DRAWING NUMBER: 203-C-209







.34 DIA. HOLE - THRU
.45 DIA. C' BORE x.25 DEEP
4 MOUNTING HOLES

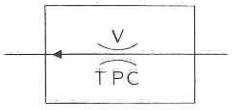
DIM. TABLE	
LET.	DIM.
A	5.29
B	5.79
C	.45
D	.75
E	1.50
F	.75
G	.25
H	1.00
J	1.10
K	1.43
L	.43
M	3.62
N	4.50
P	5.25
R	2.25
S	.40

NO.	PART NO.	DESCRIPTION	NO. REQ.
1	58-B-61	BODY SUB-ASS'Y	1
2	O-111-1	O-RING, SUB-PLATE	2
3	58-B-6	PISTON	1
4	58-A-16	SPRING, PISTON	1
5	204-10	END PLUG	1
6	00-10-2	O-RING, END PLUG	1
7	58-A-17	STOP ROD	1
8	58-A-34	END CAP	1
9	58-A-35	RETAINING RING	1
10	0-120-2	O-RING, BODY	1
11	CHART "A"	ORIFICE ACTUATOR	1
12	0-011-1	O-RING	1
13	BU-011	BACK-UP RING	1
14	58-B-10	KNOB	1
15	58-A-48	ACTUATOR-OUTER	1
16	58-A-54	LOCKPIN, ACTUATOR	1
17	58-A-15	LOCKSCREW	1
18	58-A-27	ROD, HANDLE	1
19	58-A-40	BALL, HANDLE	1
20	58-A-22	LOCKPIN, KNOB	1
21	58-A-55	PIN, ACTUATOR	1
22	10-A-7	MARKING WASHER	6
23	8-32 NC x 1/4	SOC. SET SCREW	1

CHART A
NEEDLE SPECIFICATION

FLOW RATE		NEEDLE PART NO.	MODEL NO.
CU. IN./MIN.	G.P.M.		
⊛ 0-25	0.1	58-A-59	-600-01
⊛ 0-50	0.2	58-A-58	-600-02
0-140	0.6	58-A-49	-600-06
0-700	3.0	58-A-56	-600-3
0-1400	6.0	58-A-57	-600-6

NOTES:
1. MATERIAL:
   O-RINGS — BUNA "N"
   BACK-UP RING — TEFLON
   BODY — STEEL
2. OTHER MATERIALS AVAILABLE
3. COMPENSATING PRESSURE FROM 70 PSI TO 3,000 PSI
⊛ 4. A 5 MICRON FILTER IS REQUIRED FOR THESE VALVES



J.I.C. SYMBOL

LET.	DATE	CHANGES	BY	CHK
A	6-3-64	REVISED TO LATEST DETAILS	W.WA	

MANATROL
A DIVISION OF THE PERRY-FAY CO.
200 PERRY CT. ELYRIA, OHIO

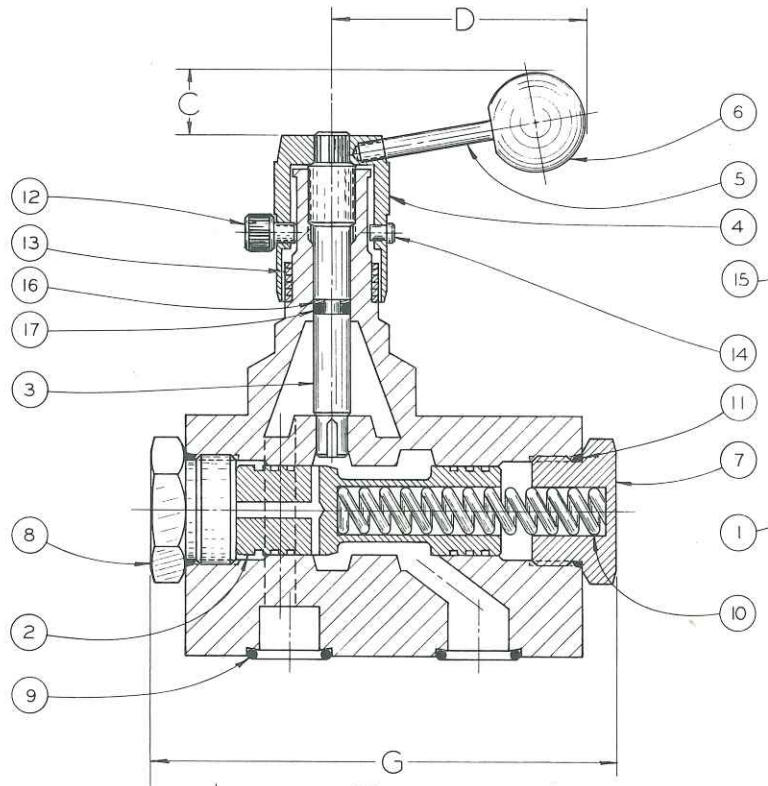
SCALE: FULL
DATE: 4-8-63
APPROVED BY: E.S. 6-12-64
DRAWN BY: W.W.A.
REVISED

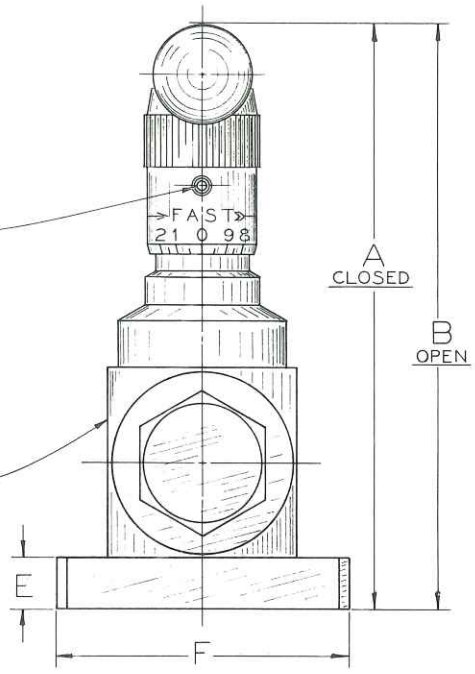
ASS'Y - TEMPERATURE PRESS. COMP. FLOW CONTROL VALVE, SUB-PLATE MTG, SIZE 3/8

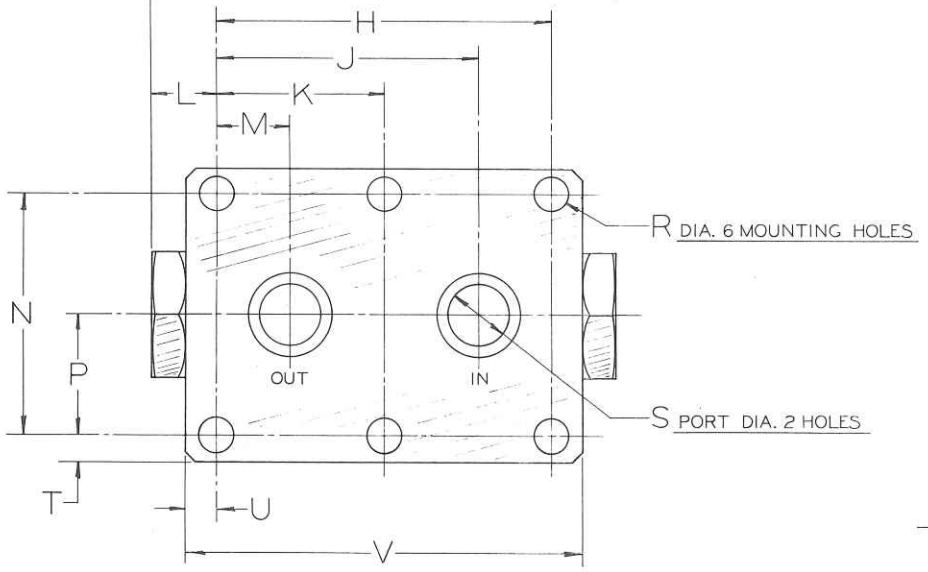
MODEL: TPCS-600

DRAWING NUMBER: 203-C-90

LET.	DIM.
A	6.92
B	7.50
C	.75
D	3.12
E	.61
F	3.50
G	5.57
H	4.00
J	3.12
K	2.00
L	.78
M	.88
N	2.87
P	1.43
R	.40
S	.72
T	.31
U	.37
V	4.75



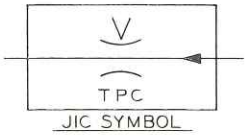




NO.	DESCRIPTION	PART NO.	QTY.
1	BODY SUB-ASSY.	59-B-36	1
2	PISTON	59-B-2	1
3	NEEDLE	59-B-32	1
4	KNOB	58-B-10	1
5	HANDLE ROD	58-A-27	1
6	HANDLE KNOB	58-A-40	1
7	END PLUG	59-A-37	1
8	END PLUG	10-A-92	1
9	O-RING, SUB PLATE	0-117-1	2
10	SPRING, PISTON	59-A-26	1
11	O-RING, END PLUG	00-16-2	2
12	LOCKSCREW	58-A-15	1
13	MARKING WASHER	10-A-7	6
14	LOCKPIN, KNOB	58-A-22	1
15	SETSCREW	8-32 x 1/4	1
16	BACK-UP RING, NEEDLE	BU-011	1
17	O-RING, NEEDLE	0-011-1	1

NOTES:

1. FLOW RATE, 0-25 G.P.M.
2. MATERIAL:
   - O-RINGS---------- BUNA "N"
   - BACK-UP RING-------TEFLON
   - BODY----------STEEL
3. OTHER MATERIALS AVAILABLE
4. COMPENSATING PRESSURE FROM 70 P.S.I. TO 3000 P.S.I.



JIC SYMBOL

MANATROL
A DIVISION OF THE PERRY-FAY CO.
200 PERRY CT. ELYRIA, OHIO

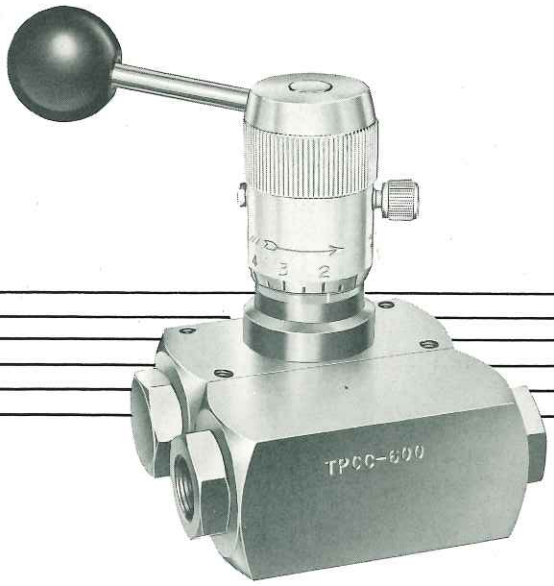
SCALE: --- APPROVED BY R. Mc 4-9-64 DRAWN BY DLS
DATE: 4-9-64 REVISED

ASSY-SUB PLATE, TEMPERATURE, PRESSURE COMPENSATED FLOW CONTROL VALVE

MODEL TPCS-1200 , SIZE 3/4 DRAWING NUMBER 203-C-212

MANATROL TEMPERATURE PRESSURE COMPENSATED FLOW CONTROL VALVES WITH INTEGRAL CHECK

TPCC AND TPCCS SERIES



LINE MOUNTED TEMPERATURE PRESSURE COMPENSATED FLOW CONTROL VALVE WITH INTEGRAL CHECK — TPCC SERIES

INTERCHANGEABLE SUB-PLATE MOUNTED TEMPERATURE PRESSURE COMPENSATED FLOW CONTROL VALVE WITH INTEGRAL CHECK — TPCCS SERIES

Manatrol TPCC and TPCCS Flow Control Valves offer a controlled flow in one direction which is virtually unaffected by variations in fluid temperature or pressure and guaranteed to $\pm 2\frac{1}{2}\%$ variation with a Δ T of 60°F. and $\pm 1\%$ variation over a Δ P of 3000 PSI. In the other direction free flow with a low pressure drop is obtained by means of an integral check valve.

These flow control valves employ a unique sharp-edged orifice which permits exceptionally fine control and allows the valve to compensate over a wide temperature differential.

Manatrol Temperature Pressure Compensated Flow Control Valves feature the exclusive Color-Coding Adjusting Scale which allows the valve to be adjusted, set, and re-set to a pre-determined flow rate by even the most inexperienced personnel. A locking thumb screw is provided so that the needle can be locked in any position desired.

ALL MANATROL TPCC AND TPCCS VALVES SHUT OFF

Valves are available in $\frac{3}{8}$ and $\frac{3}{4}$ inch sizes, line or sub-plate mounted models and with flow rates of 0 to GPM in the $\frac{3}{8}$ inch and 0 to 25 GPM in the $\frac{3}{4}$ inch.

HOW TO ORDER

Example: TPCC - 600 - 02

SERIES

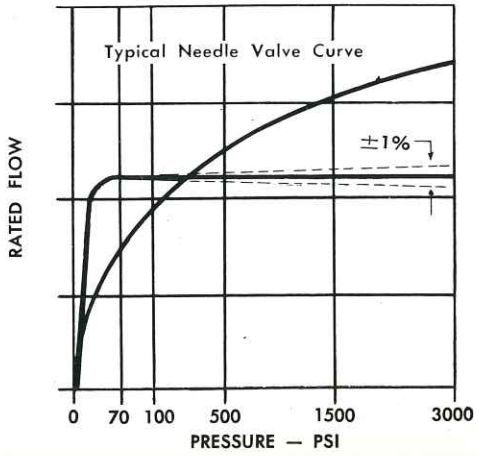
TPCC = Temp., Pres. Comp. Line Mounted
TPCCS = Temp., Pres. Comp. Sub-Plate Mounted

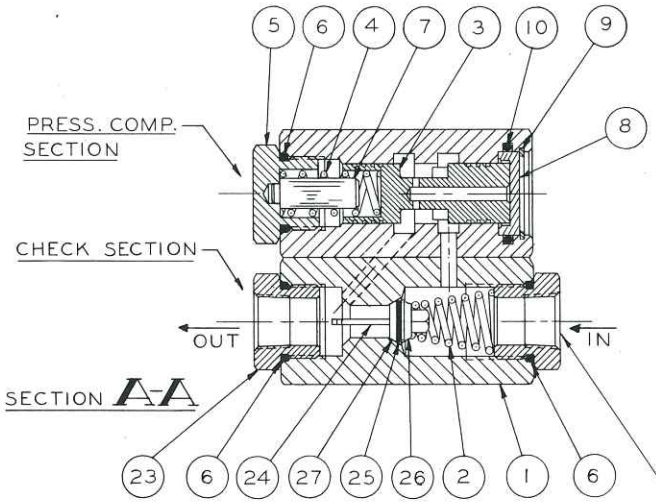
SIZE

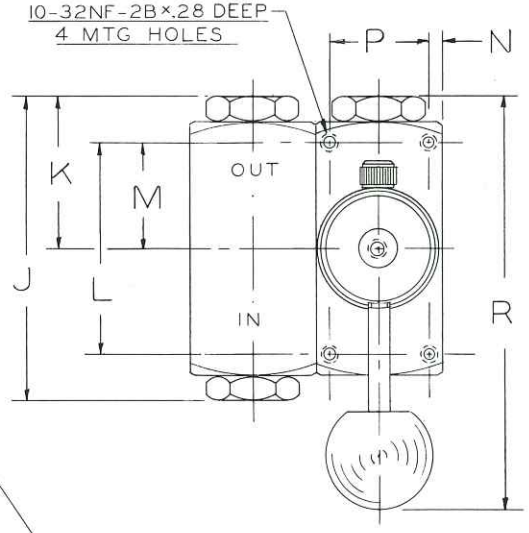
6 = $\frac{3}{8}$"
12 = $\frac{3}{4}$"

FLOW RATE

01 = 0 - 25 CIPM
02 = 0 - 50 CIPM
06 = 0 - 140 CIPM
3 = 0 - 3 GPM
6 = 0 - 6 GPM
*25 = 0 - 25 GPM
* = in $\frac{3}{4}$" only



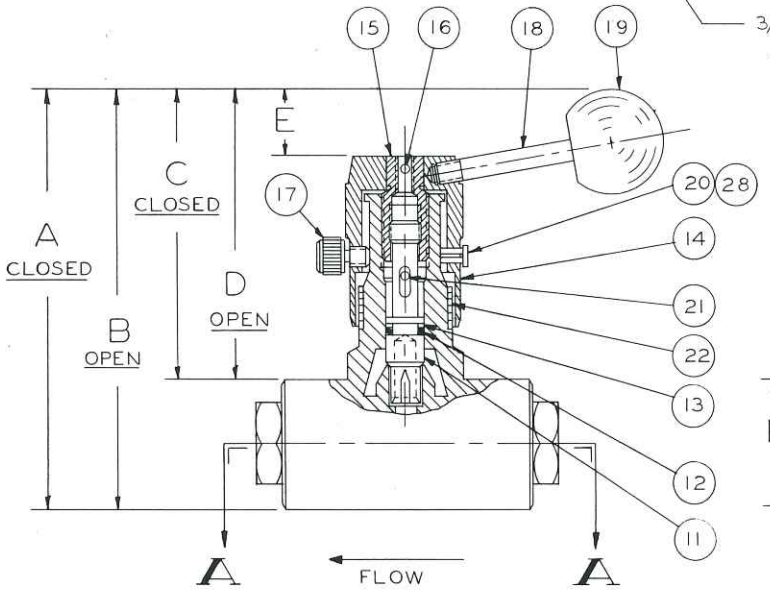


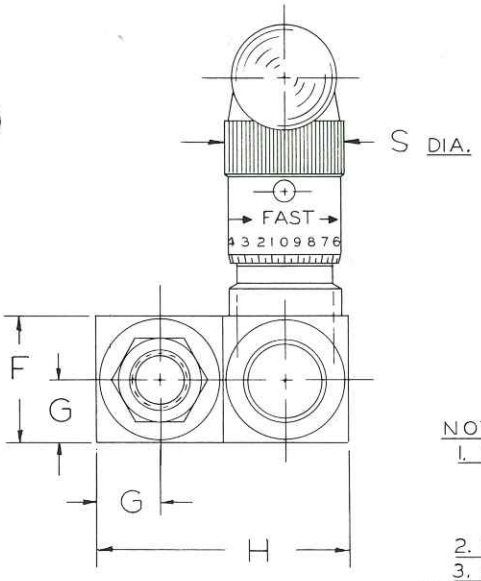


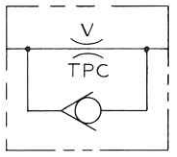
DIM. TABLE	
LET.	DIM.
A	4.84
B	5.34
C	3.34
D	3.84
E	.75
F	1.50
G	.75
H	3.00
J	3.62
K	1.81
L	2.25
M	1.12
N	.15
P	1.18
R	4.81
S	1.37

NO.	PART NO.	DESCRIPTION	NO. REQ.
1	58-B-72	BODY SUB-ASS'Y	1
2	50-A-43	SPRING, POPPET	1
3	58-B-6	PISTON	1
4	58-A-16	SPRING, PISTON	1
5	204-10	END PLUG	1
6	00-10-2	O-RING	3
7	58-A-17	STOP ROD	1
8	58-A-34	END CAP	1
9	58-A-35	RETAINING RING	1
10	0-120-2	O-RING, BODY	1
11	CHART "A"	ORIFICE ACTUATOR	1
12	0-011-1	O-RING	1
13	BU-011	BACK-UP RING	1
14	58-B-10	KNOB	1
15	58-A-48	ACTUATOR-OUTER	1
16	58-A-54	LOCKPIN, ACTUATOR	1
17	58-A-15	LOCKSCREW	1
18	58-A-27	ROD, HANDLE	1
19	58-A-40	BALL, HANDLE	1
20	58-A-22	LOCKPIN, KNOB	1
21	58-A-55	PIN, ACTUATOR	1
22	10-A-7	MARKING WASHER	6
23	4-A-67	PORT ADAPTER	2
24	4-A-129	GUIDE BLADE	1
25	4-A-31	POPPET SEAL	1
26	4-A-11	POPPET	1
27	4-A-12	POPPET RETAINER	1
28	8-32 NC x 1/4	SOC. SET SCREW	1

3/8 NPTF
2 PORTS







JIC SYMBOL

NOTES:
1. MATERIAL:
   O-RINGS & SEAL— BUNA "N"
   BACK-UP RING—TEFLON
   BODY—STEEL
2. OTHER MATERIALS AND PORT CONNECTIONS AVAILABLE
3. COMPENSATING PRESSURE FROM 70 PSI TO 3,000 PSI
⊛ 4. A 5 MICRON FILTER IS REQUIRED FOR THESE VALVES

CHART A
NEEDLE SPECIFICATION

FLOW RATE		NEEDLE PART NO.	MODEL NO.
CU. IN./MIN.	G.P.M.		
⊛ 0-25	0.1	58-A-59	-600-01
⊛ 0-50	0.2	58-A-58	-600-02
0-140	0.6	58-A-49	-600-06
0-700	3.0	58-A-56	-600-3
0-1400	6.0	58-A-57	-600-6

LET.	DATE	CHANGES	BY	CHK
A	6-3-64	REVISED TO LATEST DETAILS	W.W.A.	E.S.

MANATROL
A DIVISION OF THE PERRY-FAY CO.
200 PERRY CT. ELYRIA, OHIO

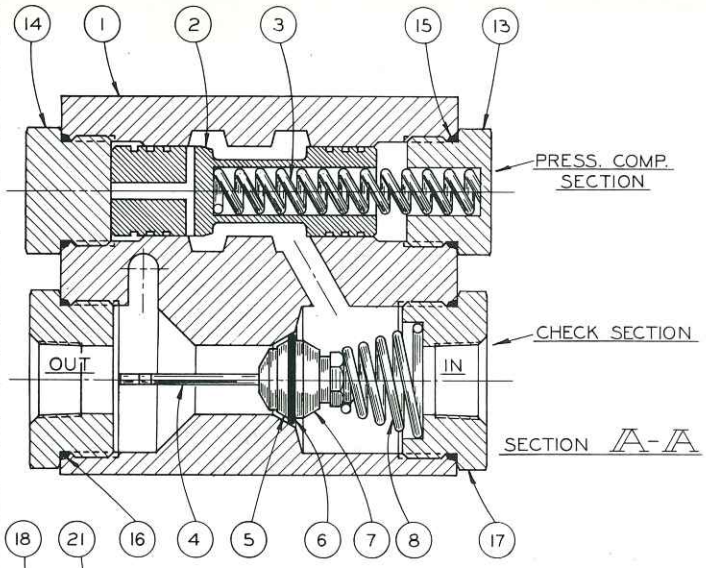
SCALE: FULL
DATE: 4-2-63
APPROVED BY E.S. 6-8-64
DRAWN BY W.W.A.
REVISED

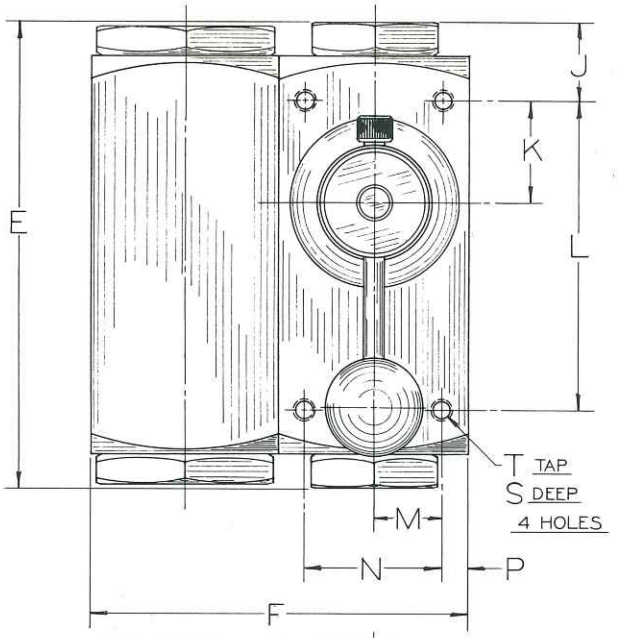
ASSY—TEMPERATURE PRESSURE COMPENSATED FLOW CONTROL VALVE W/INTEGRAL CHECK-SIZE 3/8

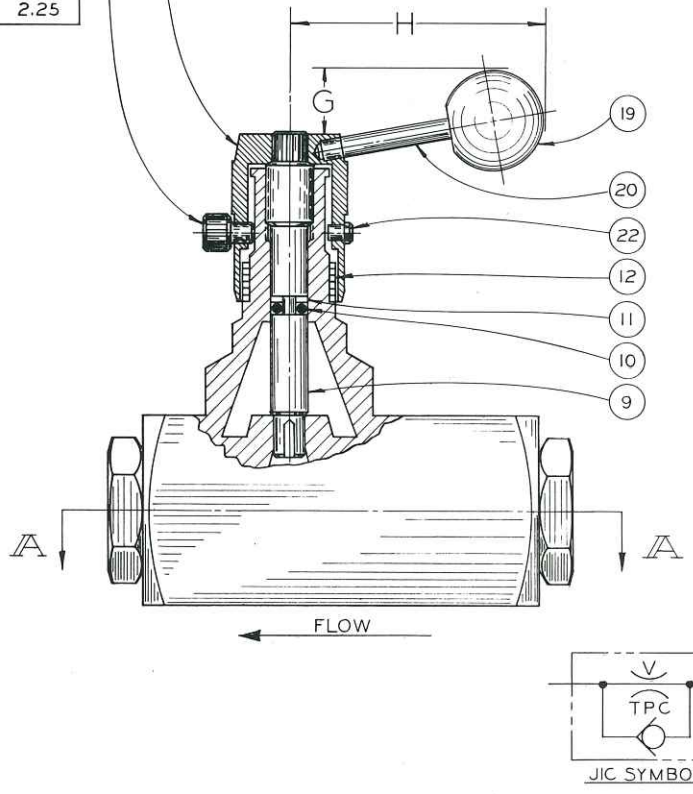
MODEL: TPCC-600

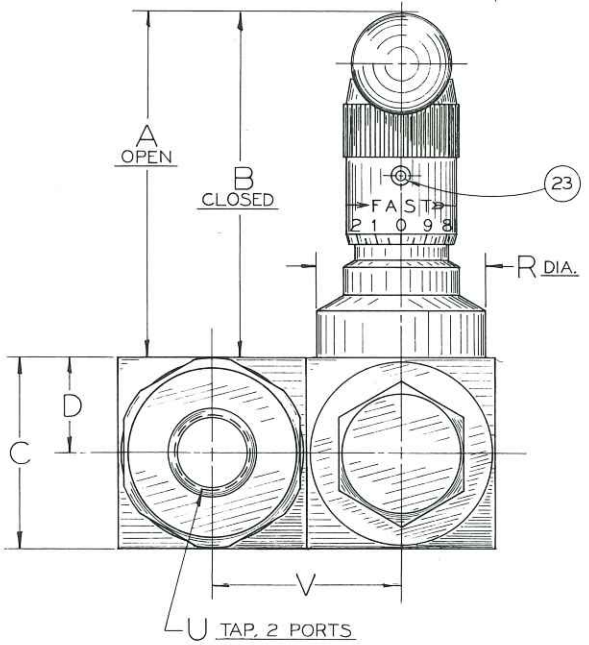
DRAWING NUMBER 203-C-89

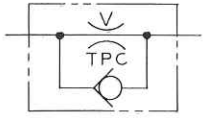
LET.	DIM.
A	4.64
B	4.06
C	2.25
D	1.12
E	5.57
F	4.50
G	.75
H	3.12
J	.93
K	1.21
L	3.68
M	.81
N	1.62
P	.31
R	2.00
S	.39
T	1/4-28
U	3/4NPTF
V	2.25











JIC SYMBOL

NO.	DESCRIPTION	PART NO.	QTY.
1	BODY	59-B-40	1
2	PISTON	59-B-2	1
3	SPRING, PISTON	59-A-26	1
4	GUIDE BLADE	25-A-93	1
5	RETAINER	25-A-13	1
6	SEAL, POPPET	25-A-17	1
7	POPPET	25-A-2	1
8	SPRING, POPPET	25-A-16	1
9	NEEDLE	59-B-32	1
10	O-RING, NEEDLE	O-011-1	1
11	BACK-UP RING, NEEDLE	BU-011	1
12	MARKING WASHER	10-A-7	6
13	END PLUG	59-A-37	1
14	END PLUG	10-A-92	1
15	O-RING, END PLUG	00-16-2	2
16	O-RING, END PLUG	00-24-2	2
17	END PLUG	59-A-14	2
18	LOCKSCREW	58-A-15	1
19	HANDLE KNOB	58-A-40	1
20	HANDLE ROD	58-A-27	1
21	KNOB	58-B-10	1
22	LOCKPIN	58-A-22	1
23	SETSCREW	8-32 x 1/4	1

NOTES

1. FLOW RATE, 0 TO 25 G.P.M.
2. MATERIALS:
   - O-RINGS & SEAL ---------- BUNA "N"
   - BACK-UP RING ---------- TEFLON
   - BODY ---------- STEEL
3. OTHER MATERIALS AVAILABLE
4. COMPENSATING PRESSURE
   70 PSI TO 3000 PSI
5. OTHER PORT CONNECTIONS AVAILABLE

TOLERANCE: UNLESS OTHERWISE SPECIFIED ALL FRACTIONAL DIM. ± .015" — ANGLES ± 2 DEGREE BREAK ALL SHARP EDGES. DO NOT SCALE DRAWINGS.

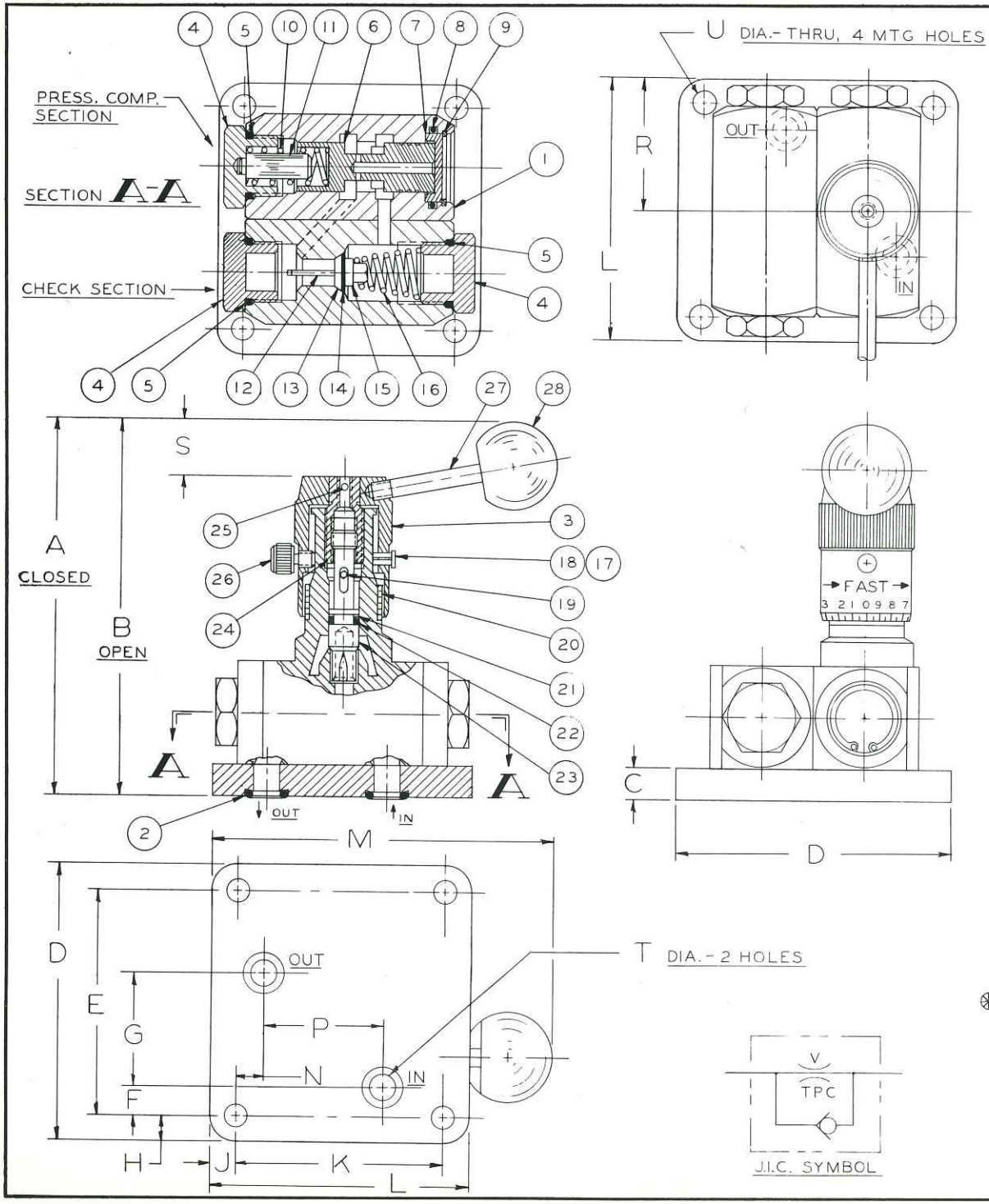
LET.	DATE	REVISIONS	By	CHK

MANATROL
A DIVISION OF THE PERRY-FAY CO.
200 PERRY CT. ELYRIA, OHIO

SCALE: FULL | APPROVED BY | DRAWN BY DLS
DATE: 4-14-64 | N. M. 4-15-64 | REVISED

ASS'Y - TEMP., PRESS. COMPENSATED, FLOW CONTROL VALVE W/INTEGRAL CHECK

MODEL: TPCC-1200 | DRAWING NUMBER 203-C-214



DIM. TABLE	
LET.	DIM.
A	5.29
B	5.79
C	.45
D	4.00
E	3.25
F	.43
G	1.62
H	.37
J	.37
K	3.00
L	3.75
M	4.87
N	.37
P	1.75
R	1.87
S	.75
T	.40
U	.34

NO.	PART NO.	DESCRIPTION	NO. REQ.
1	58-B-75	BODY SUB-ASS'Y	1
2	O-111-1	O-RING, SUB-PLATE	2
3	58-B-10	KNOB	1
4	204-10	END PLUG	3
5	00-10-2	O-RING END PLUG	3
6	58-B-6	PISTON	1
7	58-A-34	END CAP	1
8	O-120-2	O-RING BODY	1
9	58-A-35	RETAINING RING	1
10	58-A-16	SPRING, PISTON	1
11	58-A-17	STOP ROD	1
12	4-A-129	GUIDE BLADE	1
13	4-A-12	POPPET RETAINER	1
14	4-A-31	POPPET SEAL	1
15	4-A-11	POPPET	1
16	50-A-43	SPRING, POPPET	1
17	8-32 NC×1/4	SOC. SET SCREW	1
18	58-A-22	LOCKPIN, KNOB	1
19	58-A-55	PIN, ACTUATOR	1
20	10-A-7	MARKING WASHER	6
21	BU-011	BACK-UP RING	1
22	O-011-1	O-RING	1
23	CHART "A"	ORIFICE ACTUATOR	1
24	58-A-48	ACTUATOR-OUTER	1
25	58-A-54	LOCKPIN, ACTUATOR	1
26	58-A-15	LOCKSCREW	1
27	58-A-27	ROD, HANDLE	1
28	58-A-40	BALL, HANDLE	1

CHART A
NEEDLE SPECIFICATION

FLOW RATE		NEEDLE	MODEL NO.
CU. IN./MIN.	G.P.M.	PART NO.	
⊛ 0-25	0.1	58-A-59	-600-01
⊛ 0-50	0.2	58-A-58	-600-02
0-140	0.6	58-A-49	-600-06
0-700	3.0	58-A-56	-600-3
0-1400	6.0	58-A-57	-600-6

NOTES:
1. MATERIAL:
   O-RINGS & SEAL — BUNA "N"
   BACK-UP RING — TEFLON
   BODY — STEEL
2. OTHER MATERIALS AVAILABLE
3. COMPENSATING PRESSURE FROM 70 PSI TO 3000 PSI
⊛ 4. A 5 MICRON FILTER IS REQUIRED FOR THESE VALVE

LET.	DATE	CHANGES	BY	CHK
B	6-4-64	REVISED TO LATEST DETAILS	W.W.A.	E.S.

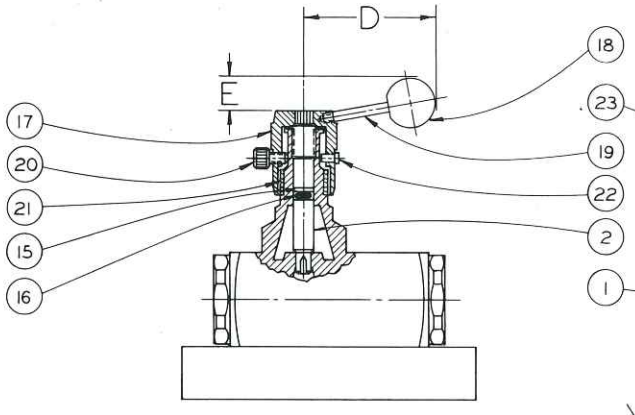
MANATROL
A DIVISION OF THE PERRY-FAY CO.
200 PERRY CT. ELYRIA, OHIO

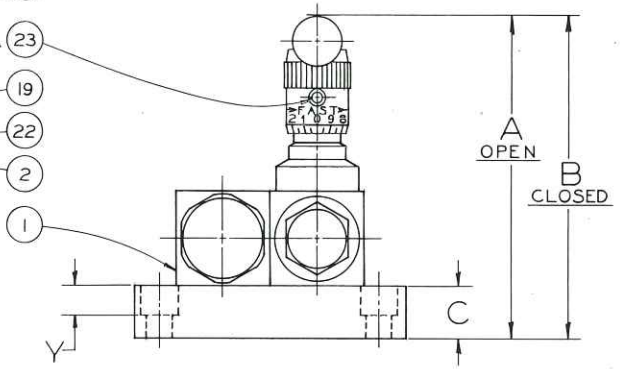
SCALE: FULL | APPROVED BY E.S. 6-12-64 | DRAWN BY W.W.A.
DATE: 4-16-63 | REVISED

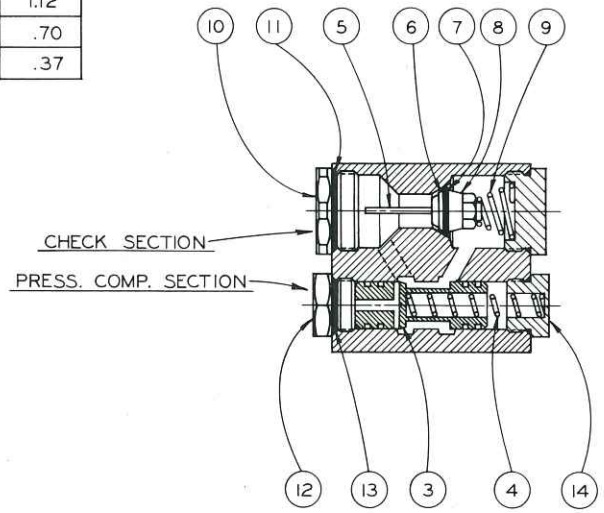
ASSY-SUB-PLATE MOUNTED TEMP. PRESS. COMPENSATED FLOW CONTROL VALVE W/INTEGRAL CHECK AND SUB-PLATE

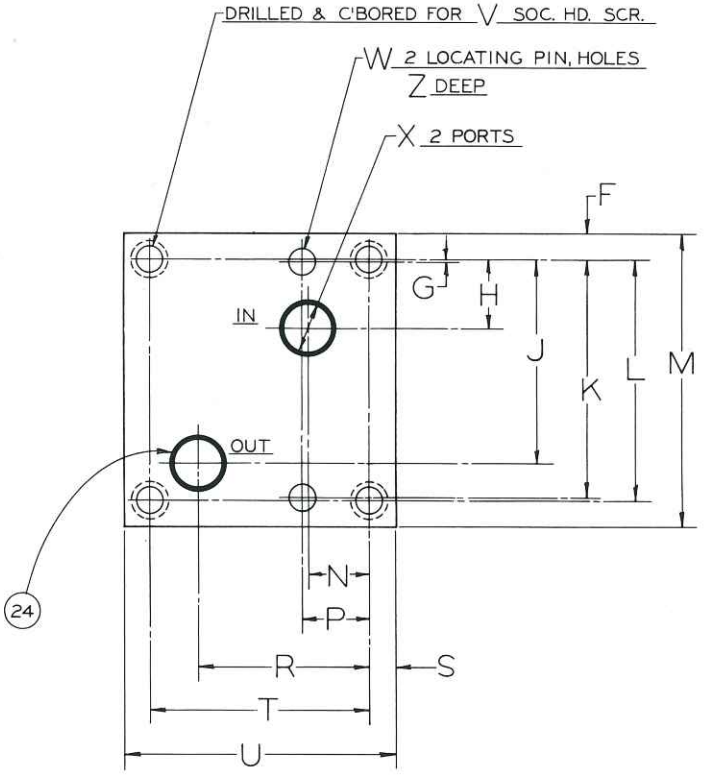
MODEL TPCCS-600 , SIZE 3/8 | DRAWING NUMBER 203-C-96

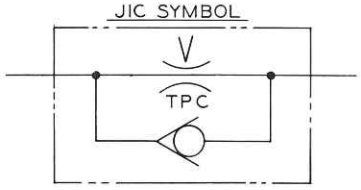
LET.	DIM.
A	8.14
B	7.56
C	1.25
D	3.12
E	.75
F	.62
G	.06
H	1.62
J	4.12
K	5.68
L	5.75
M	7.00
N	.50
P	1.62
R	4.12
S	.62
T	5.25
U	6.50
V	5/8
W	.62
X	1.12
Y	.70
Z	.37











NO.	DESCPITION	PART NO.	QTY.
1	BODY	59-B-41	1
2	NEEDLE	59-B-32	1
3	PISTON	59-B-2	1
4	SPRING, PISTON	59-A-26	1
5	GUIDE BLADE	25-A-93	1
6	RETAINER	25-A-13	1
7	SEAL, POPPET	25-A-17	1
8	POPPET	25-A-2	1
9	SPRING, POPPET	25-A-16	1
10	END PLUG	59-A-42	2
11	O-RING, END PLUG	00-24-2	2
12	END PLUG	10-A-92	1
13	O-RING END PLUG	00-16-2	2
14	END PLUG	59-A-37	1
15	BACK-UP RING, NEEDLE	BU-011	1
16	O-RING, NEEDLE	0-011-1	1
17	KNOB	58-B-10	1
18	HANDLE KNOB	58-A-40	1
19	HANDLE ROD	58-A-27	1
20	LOCKSCREW	58-A-15	1
21	MARKING WASHER	10-A-7	6
22	LOCKPIN	58-A-22	1
23	SETSCREW	8-32 x 1/4	1
24	O-RING, SUB PLATE	0-218-1	2

NOTES-

1. FLOW RATE, 0-25 G.P.M.
2. MATERIAL-
   - O-RINGS------ BUNA "N"
   - BACK-UP RING--- TEFLON
   - BODY---------- STEEL
3. OTHER MATERIALS AVAILABLE
4. COMPENSATING PRESSURE
   70 PSI TO 3,000 PSI

TOLERANCE: UNLESS OTHERWISE SPECIFIED ALL FRACTIONAL DIM. ± .015" — ANGLES ± 2 DEGREE BREAK ALL SHARP EDGES. DO NOT SCALE DRAWINGS.

LET.	DATE	REVISIONS	BY	CHK

MANATROL
A DIVISION OF THE DERRY-FAY CO.
200 PERRY CT. ELYRIA, OHIO

SCALE:
APPROVED BY
DRAWN BY DLS
DATE 4-20-64
REVISED

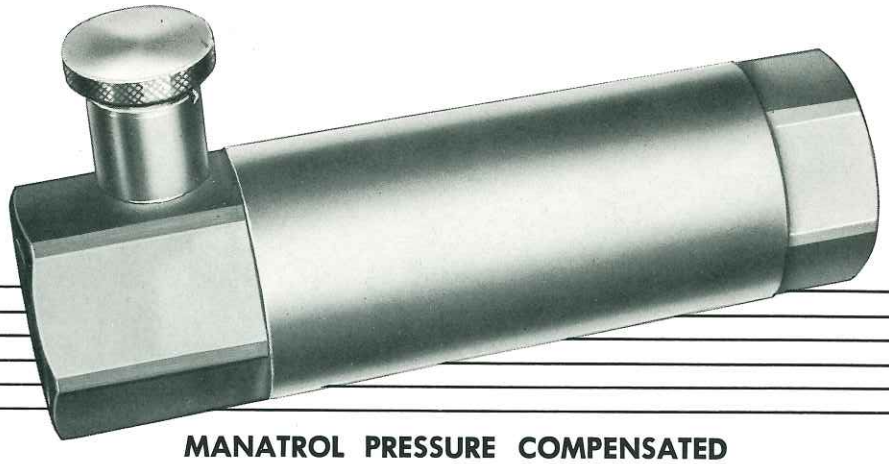
ASS'Y-SUB PLATE, TEMP., PRESS., COMP. FLOW CONTROL VALVE W/ INTEGRAL CHECK, SIZE 3/4

MODEL TPCCS-1200

DRAWING NUMBER 203-C-218

MANATROL ADJUSTABLE FLOW IN-LINE PRESSURE COMPENSATED FLOW CONTROL VALVE

PCAF SERIES



MANATROL PRESSURE COMPENSATED ADJUSTABLE FLOW VALVE PCAF SERIES

The PCAF (Pressure Compensated Adjustable Flow) Series of valves offer another significant advancement in the flow control field. Regardless of pressure fluctuations upstream or downstream of the valve, the PCAF will maintain a constant flow rate, while having a adjustable flow rate with a ratio of 10:1.

The moderate cost of the PCAF Series, coupled with its 10:1 flow range, insures adjustable pressure compensated control in an economical package.

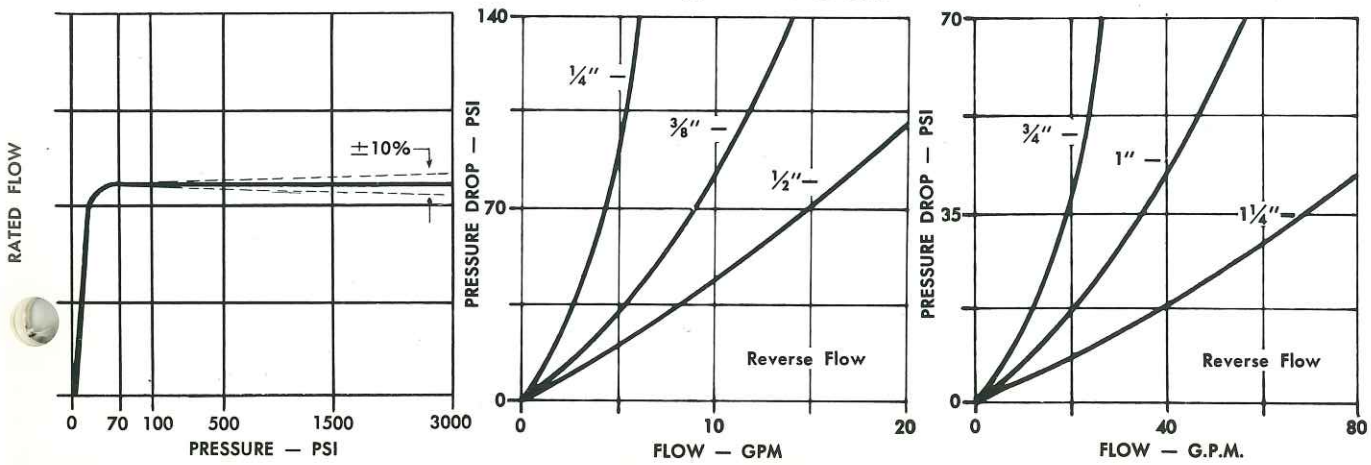
This Manatrol Flow Control Valve is QUIET! It is rugged, self-cleaning, and easily installed. Every PCAF valve is individually tested in our laboratory by trained technicians.

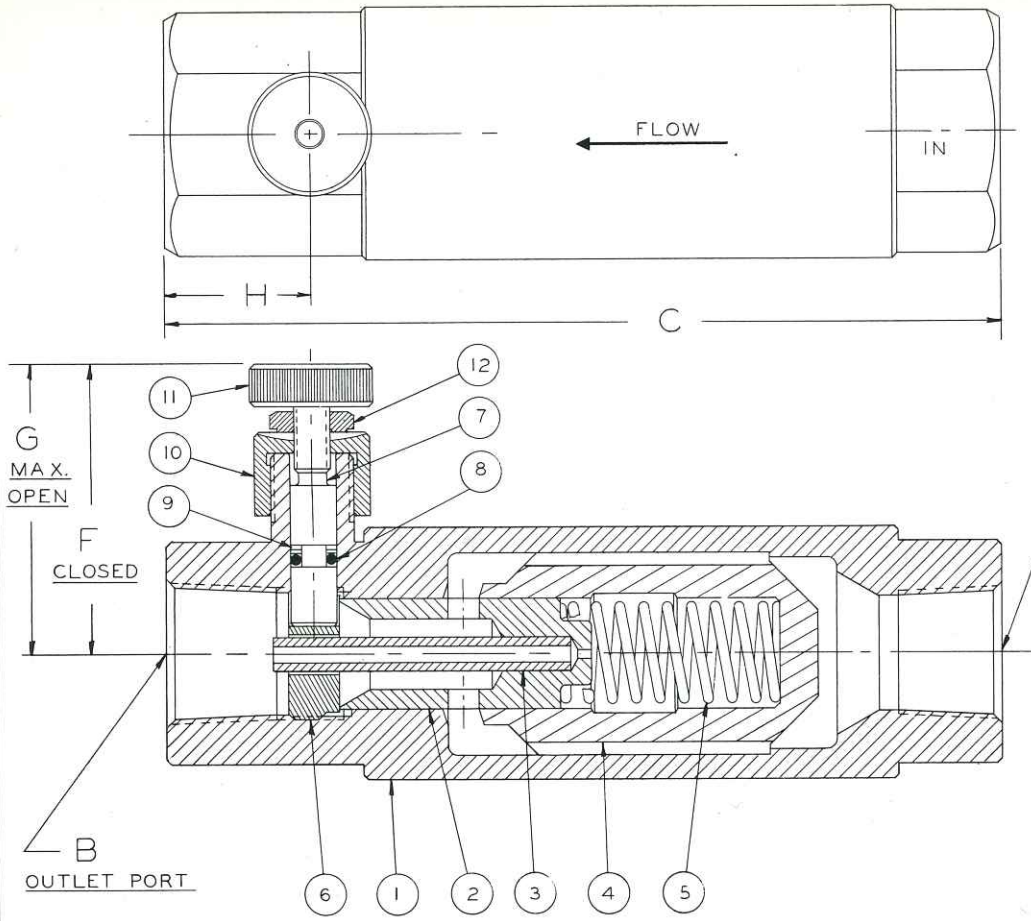
This valve is available in sizes from ¼ inch through 1¼ inches with Dryseal pipe thread ports and flow rates of .3 to 80 GPM at pressures of 70 to 3000 PSI with guaranteed accuracies of ±15% on flow rates under .5 GPM and ±10% on any flow rate above .5 GPM.

HOW TO ORDER

Example: PCAF - 600 **(This is a pressure compensated adjustable flow control valve with ⅜ NPTF ports.)**

4 = ¼" = 0.3 to 3 GPM
6 = ⅜" = 0.6 to 6 GPM
8 = ½" = 1.5 to 15 GPM
12 = ¾" = 2.5 to 25 GPM
16 = 1" = 5.0 to 50 GPM
20 = 1¼" = 8.0 to 80 GPM



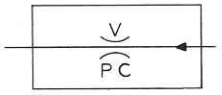


DIMENSION TABLE

MOD. NO.	LETTER							
	A PORT	B PORT	C	D	E	F	G	H
-400	1/4 NPTF	1/4 NPTF	3.62	1.00	.87	1.28	1.39	.62
-600	3/8 NPTF	3/8 NPTF	4.15	1.12	1.00	1.48	1.64	.67
-800	1/2 NPTF	1/2 NPTF	4.93	1.50	1.31	1.70	1.93	.75
-1200	3/4 NPTF	3/4 NPTF	5.50	1.75	1.56	1.96	2.28	.89
-1600	1" NPTF	1" NPTF	6.81	2.00	1.75	2.39	2.78	1.20
-2000	1 1/4 NPTF	1 1/4 NPTF	7.62	2.87	2.50	2.92	3.48	1.39

CHART A
FLOW RATE

MOD. NO.	G.P.M.	
	MIN.	MAX.
-400	0.3	3.0
-600	0.6	6.0
-800	1.5	15.0
-1200	2.5	25.0
-1600	5.0	50.0
-2000	8.0	80.0



J.I.C. SYMBOL

NO.	DESCRIPTION MODEL NO. →	MANATROL PART NO. PCAF-400	PCAF-600	PCAF-800	PCAF-1200	PCAF-1600	PCAF-2000
1	BODY	108-B-15	109-B-15	110-B-18	111-B-15	112-B-15	113-B-15
2	PISTON	108-A-6	109-A-6	110-A-8	111-B-6	112-B-6	113-B-6
3	PISTON TUBE	108-A-12	109-A-12	110-A-10	111-A-12	112-A-12	113-A-12
4	CORE	108-A-4	109-A-4	110-A-4	111-A-4	112-A-4	113-B-4
5	SPRING	108-A-7	109-A-7	110-A-9	111-A-7	112-A-7	113-A-7
6	ORIFICE	108-A-9	109-A-9	110-A-15	111-A-9	112-A-9	113-A-9
7	ADJUST. NEEDLE	108-A-11	109-A-11	110-A-12	111-A-11	112-A-11	113-A-11
8	O-RING	O-004-1	O-006-1	O-008-1	O-011-1	O-015-1	O-018-1
9	BACK-UP RING	———	BU-006	BU-008	BU-011	BU-015	BU-018
10	ADJUST. BONNET	108-A-10	109-A-10	110-A-11	111-A-10	112-A-10	113-A-10
11	ADJUST. KNOB	108-A-13	108-A-13	4-A-60	7-A-52	25-A-42	25-A-42
12	LOCKNUT	8-32 NC MACH. SCR HEX. NUT	10-32 NC MACH. SCR HEX. NUT	1/4-28 NF FIN HEX. JAM NUT	5/16-24 NF FIN. HEX. JAM NUT	7/16-20 NF FIN. HEX. JAM NUT	1/2-20 NF FIN. HEX. JAM NUT

NOTES:
1. MATERIAL:
   O-RING: BUNA-N
   BACK-UP RING: TEFLON
   BODY & COMPONENT PARTS: STEEL
2. OTHER PORT CONNECTIONS AVAILABLE
3. COMPENSATING PRESSURE FROM 70 P.S.I. TO 3,000 P.S.I.

MANATROL
A DIVISION OF THE PERRY-FAY CO.
200 PERRY CT. ELYRIA, OHIO

SCALE: NONE
DATE: 9-9-63
APPROVED BY: E.S. 6-9-64
DRAWN BY: W.W.A.
REVISED

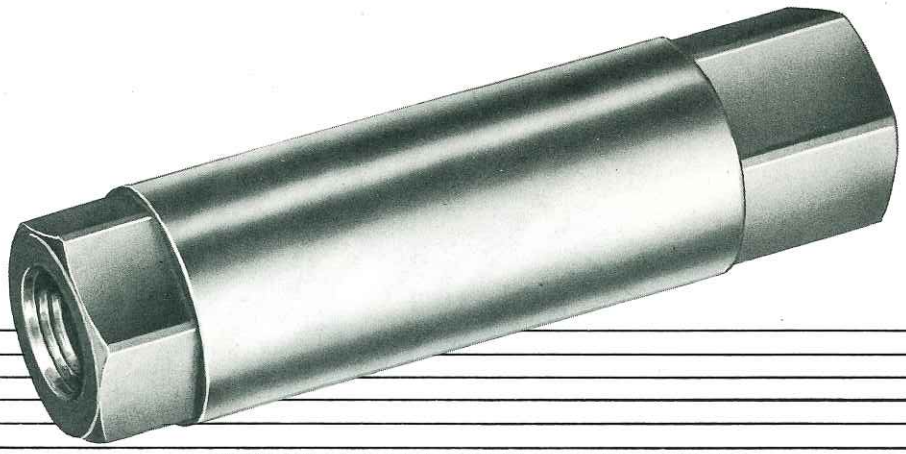
ASS'Y - PRESSURE COMPENSATED ADJUSTABLE FLOW CONTROL VALVE, IN-LINE, NPTF PORTS, SIZES 1/4-1 1/4

MODEL: "PCAF" SERIES

DRAWING NUMBER: 203-C-120

MANATROL FIXED FLOW, IN-LINE PRESSURE COMPENSATED FLOW CONTROL VALVE

PCFF SERIES



MANATROL PRESSURE COMPENSATED FIXED FLOW VALVE PCFF SERIES

The PCFF (Pressure Compensated Fixed Flow) in-line, flow control valve is a compact, economical, tamper-proof, factory pre-set package which provides a constant flow rate regardless of pressure or load fluctuations upstream or downstream of the valve.

The problem of valve failure due to seal break-down has been completely eliminated. There are no seals, only one moving part, and the valve is of all steel construction.

This Manatrol Flow Control Valve is QUIET! It is rugged, self-cleaning, and easily installed. The valve adapts to flow in the reverse direction very readily with a minimum pressure drop.

This valve is available in sizes from ¼ inch through 1¼ inches with Dryseal pipe thread ports and flow rates of .3 to 80 GPM at pressures of 70 to 3000 PSI with guaranteed accuracies of ±15% on flow rates under .5 GPM and ±10% on any flow rate above .5 GPM.

The PCFF Valve can be matched to any flow rate specified with accuracies of ±10%. This service is done in our modern, well-equipped laboratory by trained technicians and is available to the customer at no cost.

When ordering specify the required flow rate.

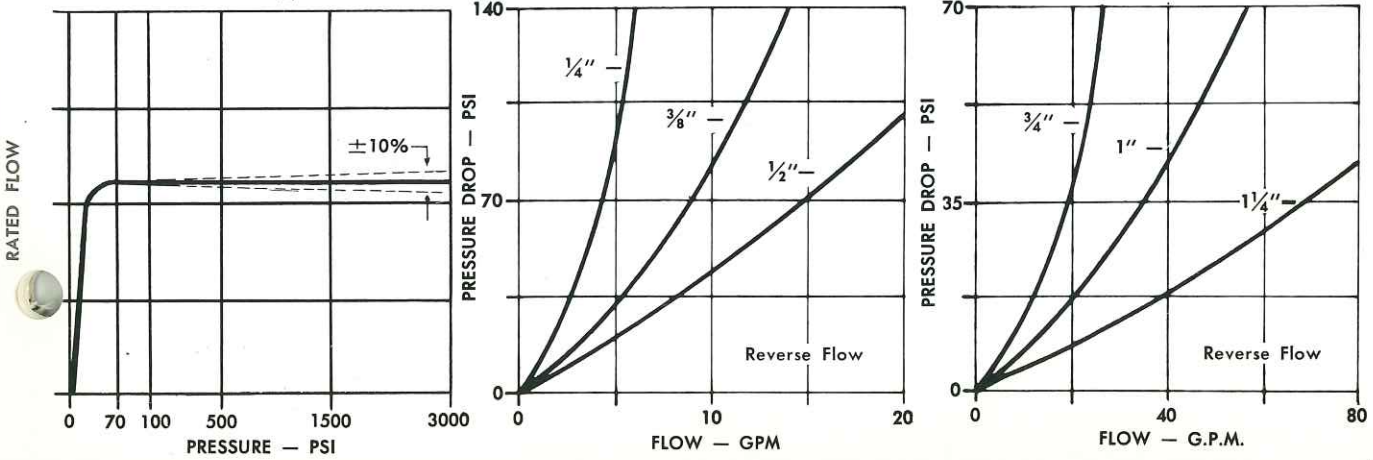
HOW TO ORDER

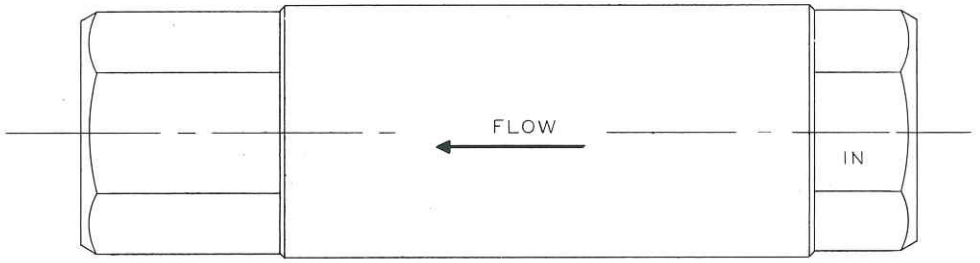
Example: PCFF - 400 - 1.5 **(This valve is the pressure compensated fixed flow valve with ¼ NPTF ports and set at 1.5 GPM.)**

SIZE — FLOW RATE

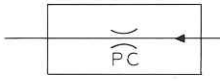
4 = ¼"
6 = ⅜"
8 = ½"
12 = ¾"
16 = 1"
20 = 1¼"

4 = .3 to 3 GPM
6 = .6 to 6 GPM
8 = 1.5 to 15 GPM
12 = 2.5 to 25 GPM
16 = 5.0 to 50 GPM
20 = 8.0 to 80 GPM

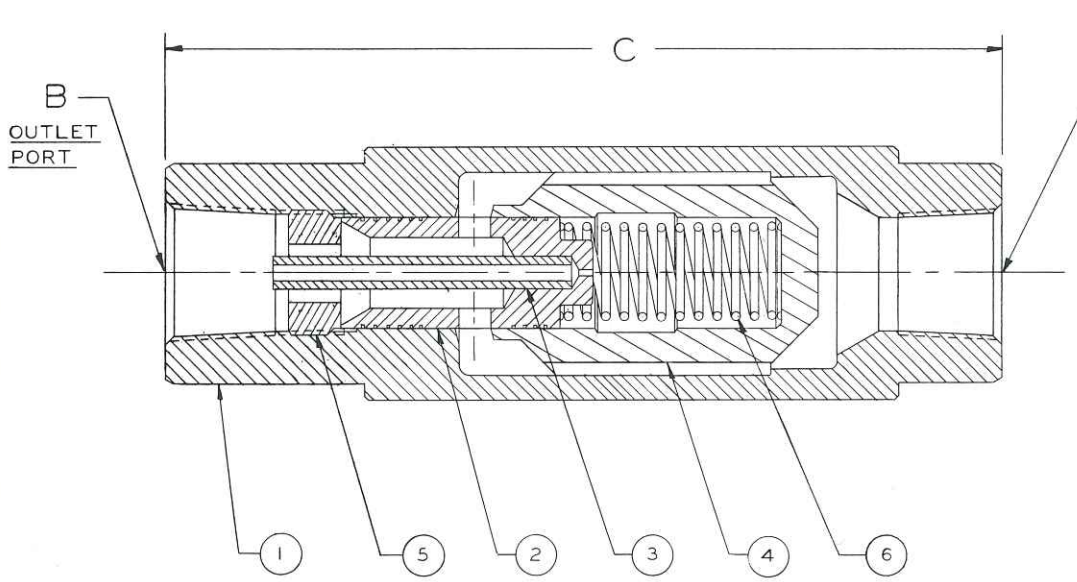




NOTES:
1. MATERIAL:
   BODY & COMPONENT PARTS — STEEL
2. OTHER PORT CONNECTIONS AVAILABLE
3. COMPENSATING PRESSURE FROM 70 P.S.I. TO 3,000 P.S.I.



J.I.C. SYMBOL



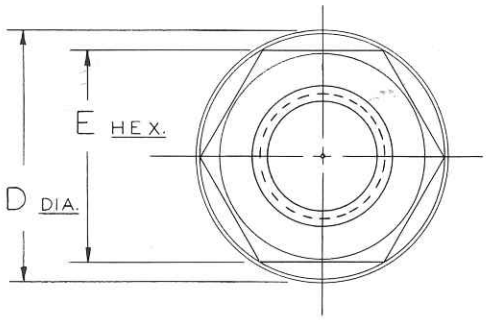


CHART A
FLOW RATE

MOD. NO.	G. P. M. MIN.	MAX.
-400	0.3	3.0
-600	0.6	6.0
-800	1.5	15.0
-1200	2.5	25.0
-1600	5.0	50.0
-2000	8.0	80.0

DIMENSION TABLE

MOD. NO.	LETTER A PORT	B PORT	C	D	E
-400	1/4 NPTF	1/4 NPTF	3.62	1.00	.87
-600	3/8 NPTF	3/8 NPTF	4.15	1.12	1.00
-800	1/2 NPTF	1/2 NPTF	4.93	1.50	1.31
-1200	3/4 NPTF	3/4 NPTF	5.50	1.75	1.56
-1600	1" NPTF	1" NPTF	6.81	2.00	1.75
-2000	1 1/4 NPTF	1 1/4 NPTF	7.62	2.87	2.50

DESCRIPTION NO.	MODEL NO. →	MANATROL PART NO. PCFF-400	PCFF-600	PCFF-800	PCFF-1200	PCFF-1600	PCFF-2000
1	BODY	108-B-16	109-B-16	110-B-19	111-B-16	112-B-16	113-B-16
2	PISTON	108-A-6	109-A-6	110-A-8	111-B-6	112-B-6	113-B-6
3	PISTON TUBE	108-A-12	109-A-12	110-A-10	111-A-12	112-A-12	113-A-12
4	CORE	108-A-4	109-A-4	110-A-4	111-A-4	112-A-4	113-B-4
5	ORIFICE	108-A-5	109-A-5	110-A-13	111-A-5	112-A-5	113-A-5
6	SPRING	108-A-7	109-A-7	110-A-9	111-A-7	112-A-7	113-A-7

MANATROL
A DIVISION OF THE PERRY-FAY CO.
200 PERRY CT. ELYRIA, OHIO

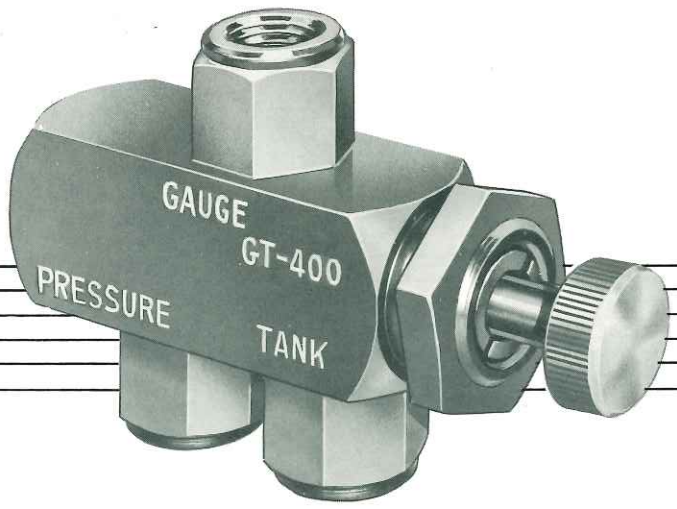
SCALE: NONE
DATE: 3-7-63
APPROVED BY E.S. 6-10-64
DRAWN BY W.W.A.
REVISED

ASS'Y — PRESSURE COMPENSATED FIXED FLOW CONTROL VALVE, IN-LINE, NPTF PORTS, SIZES: 1/4-1 1/4

MODEL: "PCFF" SERIES

DRAWING NUMBER 203-C-116

GT SERIES



PUSH-TO-READ VALVE

The Manatrol Push-To-Read Valve is designed to prevent gauge damage due to pressure surges in all types of hydraulic circuits. By maintaining correct pressure at all times with accurate gauges, damage to hydraulic components is prevented.

Located in the gauge line, the spring loaded, balanced piston is normally closed isolating the gauge from pressure. Depressing the knob opens the line to the gauge permitting a reading. When the knob is released, pressure to the gauge is cut off and the gauge is drained to tank.

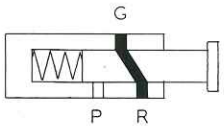
The Push-To-Read Valve is rugged, compact, and of **ALL STEEL CONSTRUCTION** which can be panel or line mounted in any position, and available in ¼" NPTF Ports, with a 3000 PSI pressure rating.

The force required to depress the knob is 10 lbs. and the maximum leakage rate is 0.01 cubic inches per minute.

HOW TO ORDER

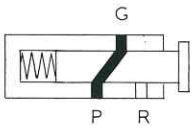
GT-400

FLOW DIAGRAM



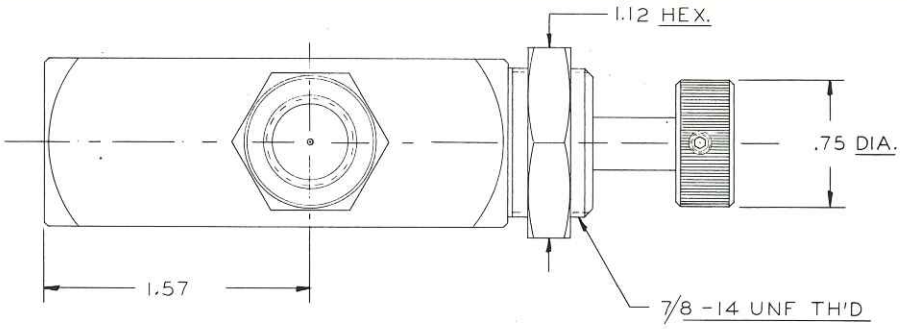
POSITION I

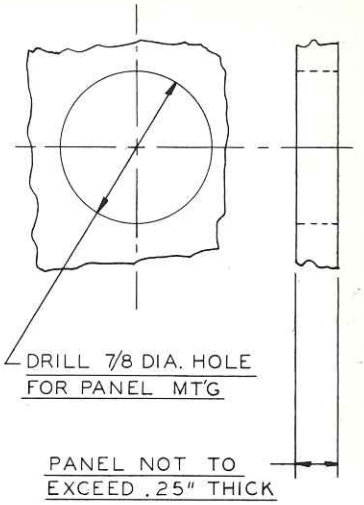
PRESSURE OFF GAUGE PORT TO RETURN

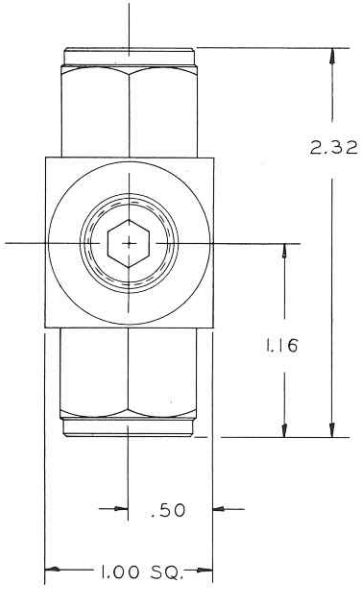


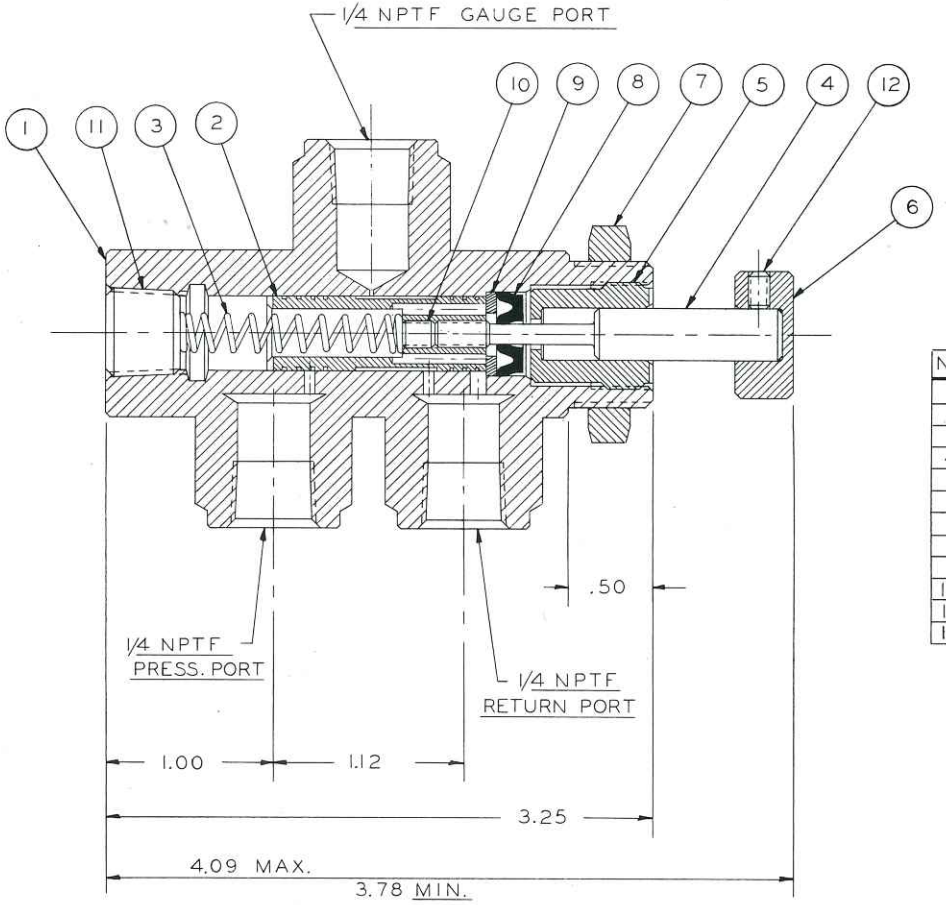
POSITION II

PRESSURE TO GAUGE RETURN PORT OFF









NO.	DESCRIPTION	PART NO.
1	BODY	1-B-210
2	PISTON	1-A-171
3	SPRING	1-A-211
4	PISTON ROD	1-A-197
5	SLEEVE	1-A-196
6	PUSH BUTTON	1-A-172
7	PANEL NUT	1-A-82
8	U-CUP PACKING	1-A-212
9	NYLON WASHER	1-A-198
10	SOCKET SET SCREW	6-32 NC x 1/4
11	HEX. HOLLOW PIPE PLUG	1/4 NPTF
12	SOC. SET SCREW	5-40 NC x 1/4

NOTES:
1. MATERIAL:
   PACKING: BUNA-N
   BODY: STEEL
2. OTHER MATERIALS AND PORT CONNECTIONS AVAILABLE
3. RECOMMENDED MAXIMUM WORKING PRESSURE: 5000 PSI

MANATROL
A DIVISION OF THE PERRY-FAY CO.
200 PERRY CT. ELYRIA, OHIO

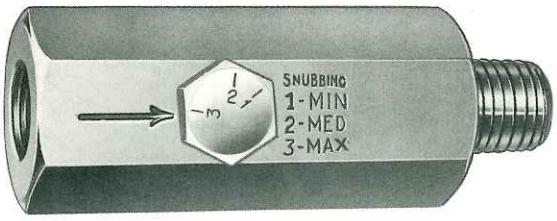
SCALE: 2 x SIZE | APPROVED BY T.Z. 12-11-63 | DRAWN BY W.W.A.
DATE: 12-12-63 | REVISED

ASSEMBLY - PUSH TO READ
3 WAY VALVE, SIZE 1/4"

MODEL: GT-400 | DRAWING NUMBER 203-C-114

GF AND G SERIES

FIXED GAUGE SNUBBER



ADJUSTABLE GAUGE SNUBBER

MANATROL FIXED GAUGE SNUBBER

An all-steel device which effectively reduces hydraulic and pneumatic pressure surges and thus increases the life of gauges and instruments. The Snubber uses the time proven principle of a capillary tube to deaden shock waves. The capillary path allows a relatively large flow but still provides high resistance to shock waves. A moderately rapid, yet smooth response of the pressure sensitive instrument is obtained free of transient line surges or pulsations.

Manatrol Snubbers are excellent in application where a pressure sensitive device may be suddenly vented to tank. Here the Snubber will provide protection when reading either up or down the scale. Another application of Manatrol Snubbers is in systems which establish pulsations, such as reciprocating machines or force pumps.

This rugged device has **NO MOVING PARTS, NO SEALS,** nothing to wear out or be damaged. For protection against extremely violent fluctuations, two or more Snubbers may be mounted in series, thereby providing multiple gauge insurance. The Snubber is available in ¼" and ½" NPTF sizes and has a maximum operating pressure of 10,000 PSI.

MANATROL ADJUSTABLE GAUGE SNUBBER

The Manatrol Adjustable Snubber is an externally adjustable snubber. It also utilizes the capillary tube for snubbing action but by moving the hexagonal indicator to position 1, 2, and 3, the operator can immediately select a range which is most suitable to his application.

This valve is available in ¼" and ½" NPTF and has a maximum operating pressure of 3000 PSI.

HOW TO ORDER

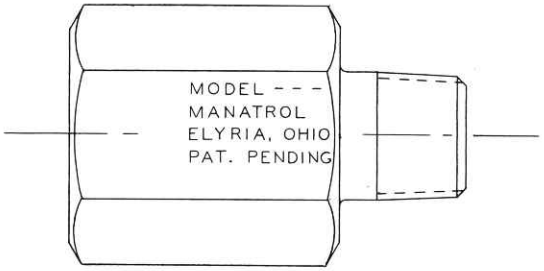
GF-400 S

S = Steel
B = Brass

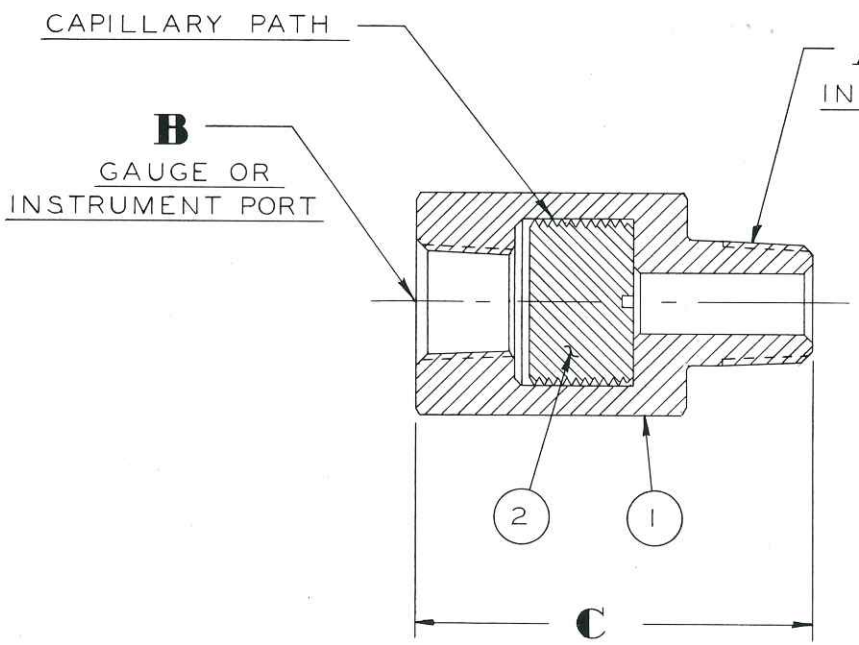
GF = Fixed
G = Adjustable

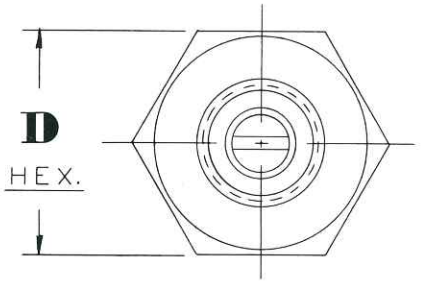
4 = ¼"
8 = ½"

DESCRIPTION		MANATROL PART NO.	
NO.	MODEL NO. →	GF-400	GF-800
1	BODY	1-B-224	7-B-106
2	CORE	1-A-217	1-A-217



DIMENSION TABLE				
MOD. NO.	LETTER			
	A PORT	**B** PORT	**C**	**D**
-400	1/4 NPTF	1/4 NPTF	1.78	1.00
-800	1/2 NPTF	1/2 NPTF	2.15	1.25





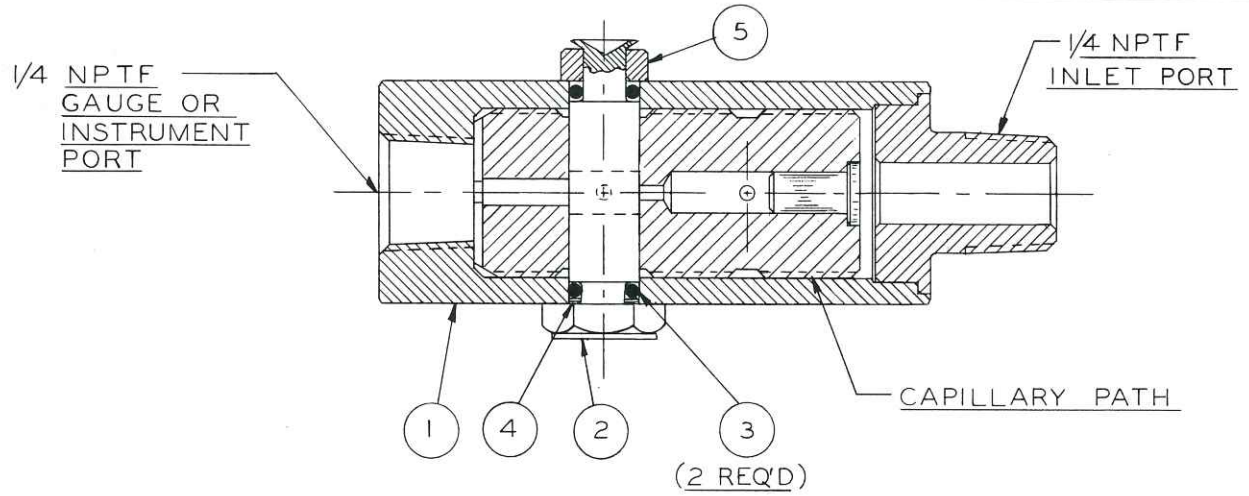
NOTES:
1. MATERIAL:
   BODY & CORE: STEEL
2. OTHER MATERIAL AND PORT CONNECTIONS AVAILABLE
3. RECOMMENDED MAX. WORKING PRESSURE IS 10,000 P.S.I.

MANATROL
A DIVISION OF
THE PERRY-FAY Co.
200 PERRY CT. ELYRIA, OHIO

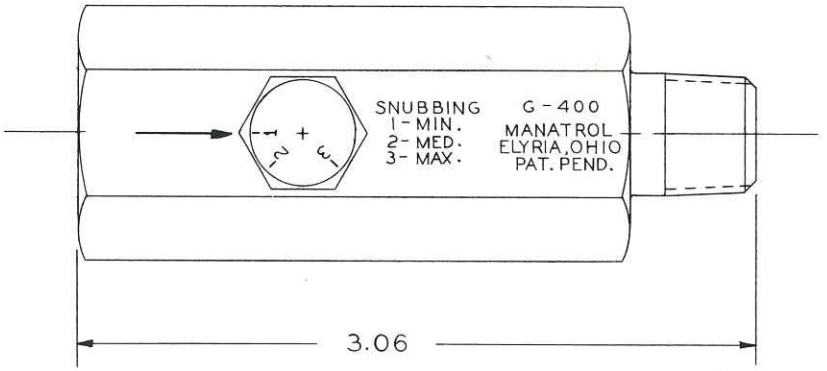
SCALE: —
DATE: 2-19-64
APPROVED BY T.Z 2-19-64
DRAWN BY W.W.A.
REVISED

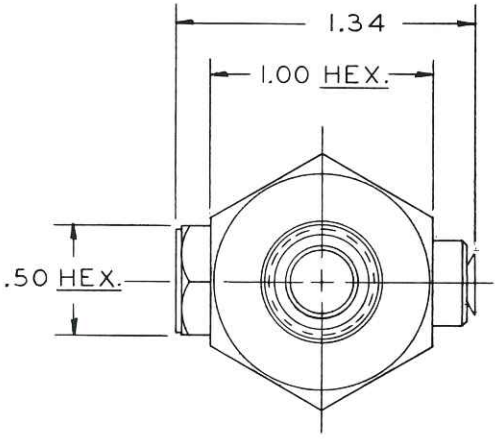
ASSEMBLY - GAUGE SNUBBER
FIXED PATH, SIZES: 1/4 & 1/2

MODEL: GF-400 & GF-800
DRAWING NUMBER 203-B-167



NO.	DESCRIPTION	PART NO.
1	BODY SUB-ASS'Y	1-B-184
2	SELECTOR NEEDLE	1-B-186
3	O-RING	O-008-1
4	BACK-UP RING	BU-008
5	RETAINER	1-A-187





NOTES:

1. MATERIAL:
   BACK-UP RING: TEFLON
   O-RINGS: BUNA-N
   BODY & COMPONENT PARTS: STEEL
2. RECOMMENDED MAX. WORKING PRESSURE: 3,000 P.S.I.
3. OTHER MATERIALS & PORT CONNECTIONS AVAILABLE

LET.	CHANGES	DATE
C	REDRAWN & REVISED	3-4-64

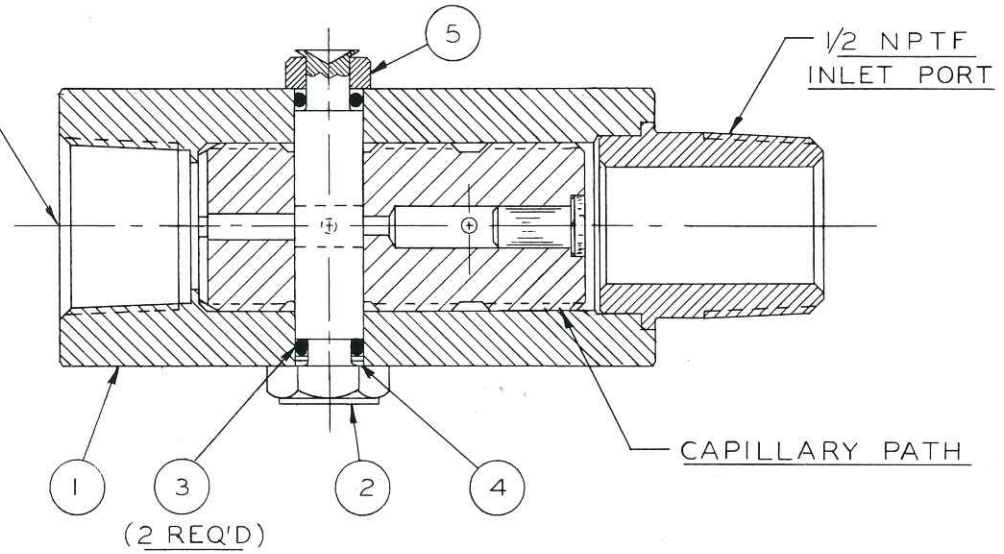
MANATROL
A DIVISION OF
THE PERRY-FAY CO.
200 PERRY CT. ELYRIA, OHIO

SCALE: 2 X SIZE
DATE: 8-15-63
APPROVED BY T. Z. 8-22-63
DRAWN BY W.W.A.
REVISED

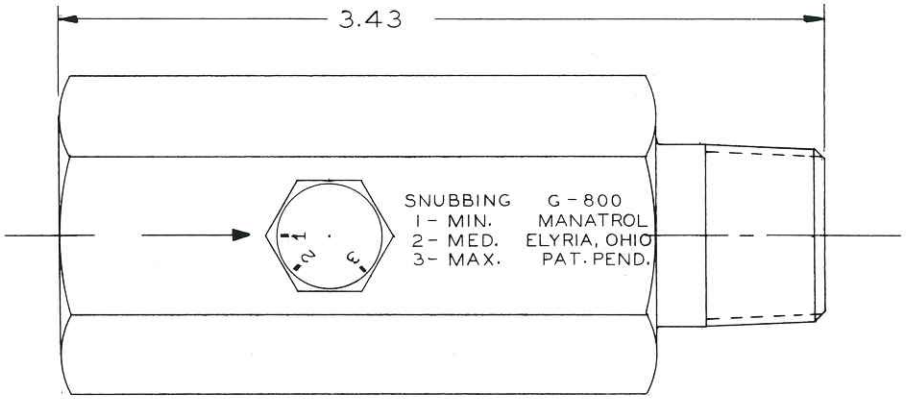
ASSEMBLY - ADJUSTABLE GAUGE SNUBBER, SIZE 1/4"

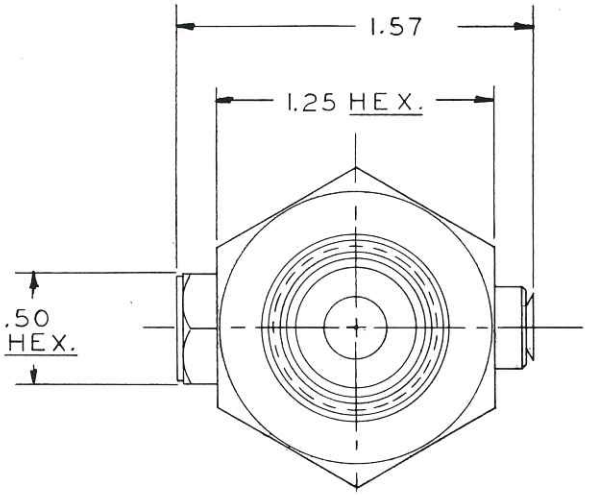
MODEL: G-400

DRAWING NUMBER 203-B-107



NO.	DESCRIPTION	PART NO.
1	BODY SUB-ASS'Y	7-B-87
2	SELECTOR NEEDLE	7-B-86
3	O-RING	O-008-1
4	BACK-UP RING	BU-008
5	RETAINER	1-A-187





NOTES:

1. MATERIAL:
   - O-RINGS: BUNA-N
   - BACK-UP RING: TEFLON
   - BODY & COMPONENT PARTS: STEEL
2. RECOMMENDED MAX. WORKING PRESSURE: 3,000 P.S.I.
3. OTHER MATERIALS & PORT CONNECTIONS AVAILABLE

LET.	CHANGES	DATE
C	REDRAWN & REVISED	3-3-64

MANATROL
A DIVISION OF
THE PERRY-FAY CO.
200 PERRY CT. ELYRIA, OHIO

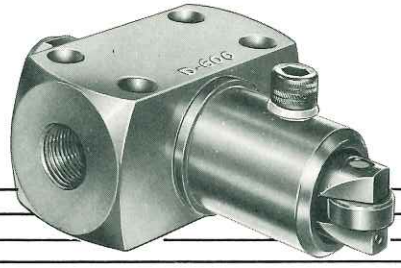
SCALE: 2 X SIZE
DATE: 8-21-63
APPROVED BY T. Z. 8-22-63
DRAWN BY W.W.A.
REVISED

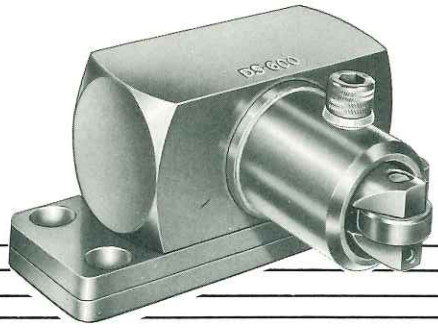
ASSEMBLY - ADJUSTABLE GAUGE SNUBBER, SIZE 1/2"

MODEL: G-800

DRAWING NUMBER 203-B-108

D and DS SERIES





MANATROL LINE MOUNTED CAM OPERATED 2-WAY, D SERIES

MANATROL SUB-PLATE MOUNTED CAM OPERATED 2-WAY, DS SERIES

Manatrol Cam Operated 2-Way Deceleration Valves are normally open and allow full flow in either direction until the plunger is depressed. When the plunger is depressed, flow in either direction is blocked. The Manatrol "D" and "DS" Valves can be used as a shut off and/or deceleration valve.

This series is available as an in line model with $\frac{3}{8}$ NPTF ports or a sub plate mounted model. All "D" and "DS" valves have a maximum working pressure of 2000 PSI.

These valves can be mounted in any position. The plunger can be rotated 90° to accomodate for either horizontal or vertical cam movement, and requires 30 lbs. to depress.

Both the in line and sub plate mounted valves have an external drain that must be connected directly to tank with a maximum allowable back pressure of 20 PSI.

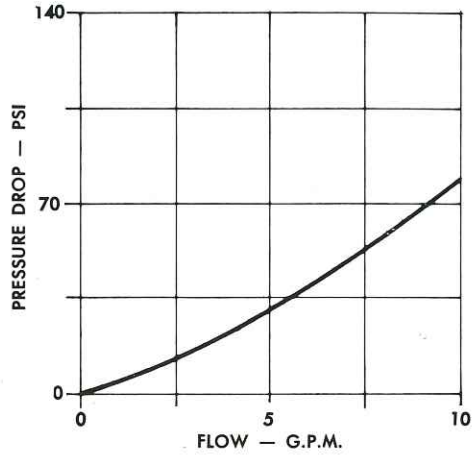
IMPORTANT: Leakage rate on all Manatrol "D" and "DS" Valves is a maximum of 5.0 cubic inches per minute with 150 SSU hydraulic oil at 1000 PSI.

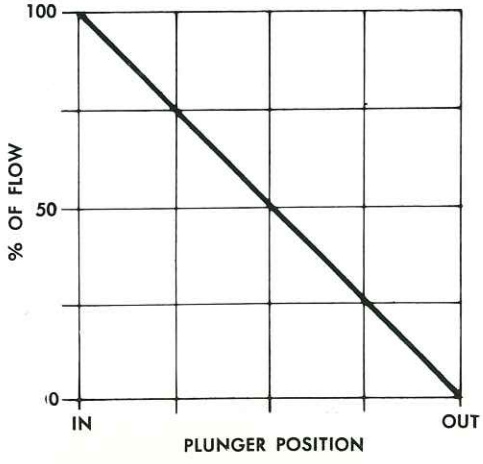
HOW TO ORDER

DS - 600

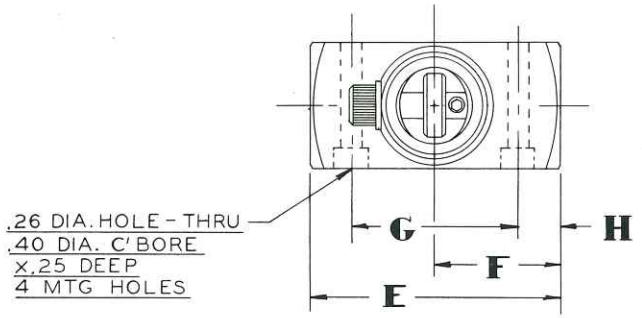
STYLE

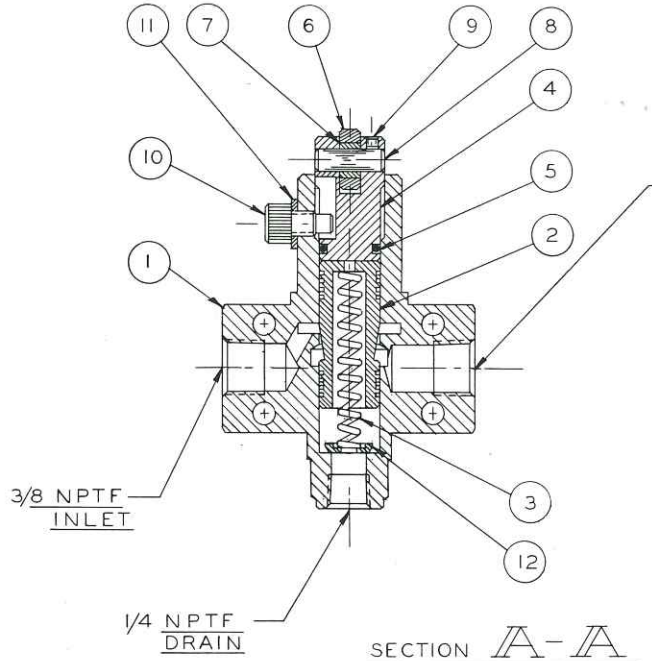
D = Line Mounted
DS = Sub Plate Mounted



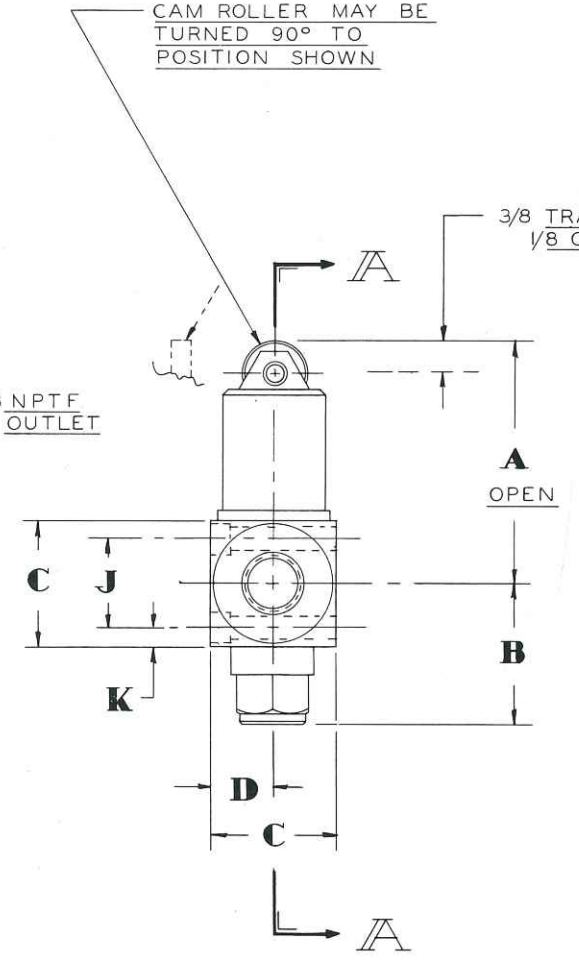


NO.	PART NO.	DESCRIPTION
1	81-B-50	BODY
2	81-A-3	PISTON
3	81-A-15	SPRING
4	81-A-4	PLUNGER
5	O-113-1	O-RING, PLUNGER
6	81-A-5	ROLLER
7	81-A-40	BEARING
8	81-A-16	SHAFT, ROLLER
9	8-32 NC x 1/8	SOC. SET SCREW
10	81-A-17	GUIDE SCREW
11	4-A-80	WASHER
12	7-A-12	RETAINER, SPRING



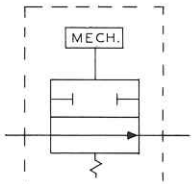


SECTION A-A



NOTES:
1. MATERIAL:
   O-RING: BUNA-N
   BODY: STEEL
2. RECOMMENDED MAX. WORKING PRESSURE IS 3,000 P.S.I.

DIMENSION TABLE									
LETTER									
A	B	C	D	E	F	G	H	J	K
2.78	1.68	1.50	.75	3.00	1.50	2.00	.50	1.06	.21



J.I.C. SYMBOL

TOLERANCE: UNLESS OTHERWISE SPECIFIED ALL FRACTIONAL DIM. ± .015"—ANGLES ± 2 DEGREE BREAK ALL SHARP EDGES. DO NOT SCALE DRAWINGS.

LET.	DATE	REVISIONS	BY	CHK
F	5-27-64	REDRAWN AND REVISED	WA	E.S.

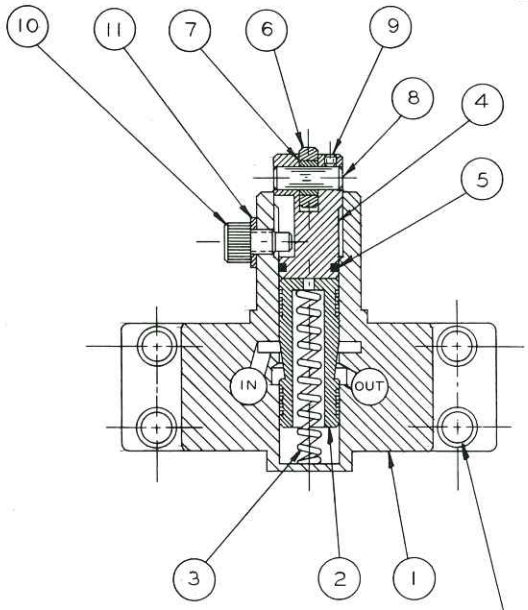
MANATROL
A DIVISION OF THE PERRY-FAY CO.
200 PERRY CT. ELYRIA, OHIO

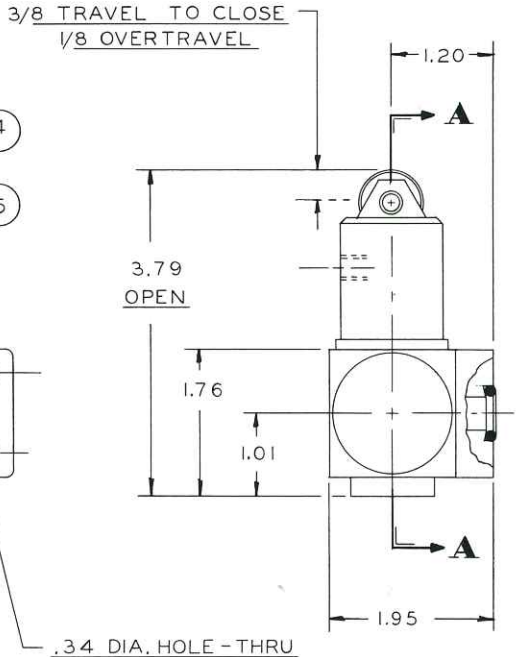
SCALE: FULL | APPROVED BY: E.S. 5-27-64 | DRAWN BY: W. W.A.
DATE: 5-27-64 | REVISED

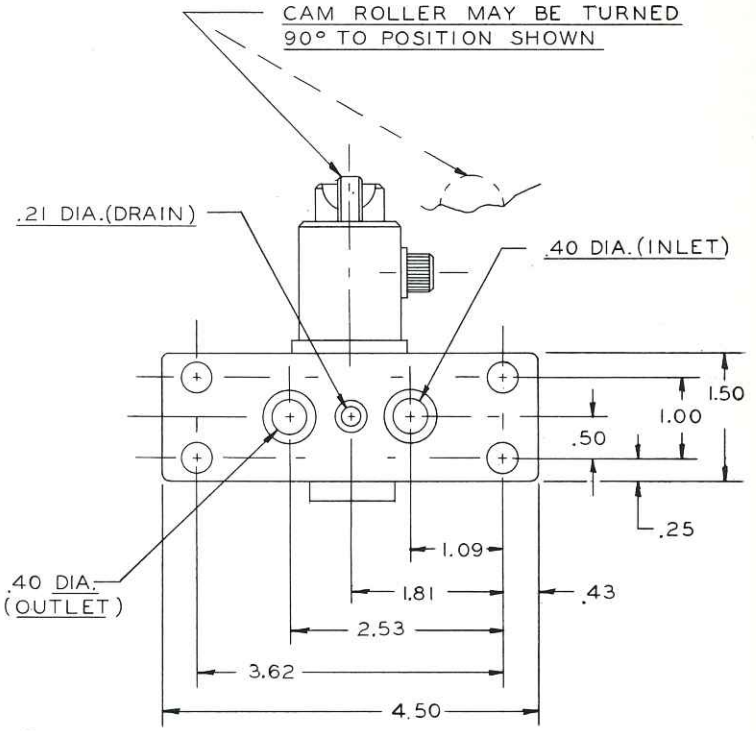
ASS'Y — DECELERATION VALVE, SIZE: 3/8, 3/8 NPTF PORTS

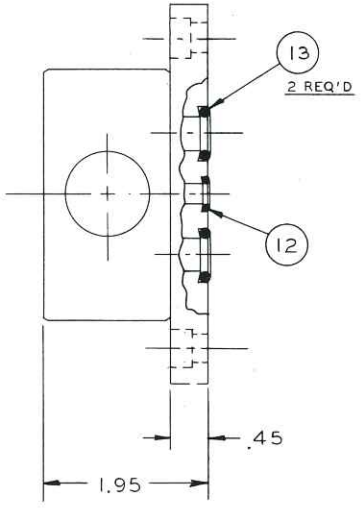
MODEL: D-600

DRAWING NUMBER: 203-C-68



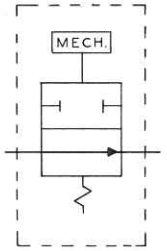






NOTES:
1. MATERIAL:
   O-RINGS: BUNA-N
   BODY: STEEL
2. RECOMMENDED MAX. WORKING PRESSURE IS 3,000 P.S.I.

NO.	PART NO.	DESCRIPTION
1	81-B-43	BODY
2	81-A-3	PISTON
3	81-A-15	SPRING
4	81-A-4	PLUNGER
5	O-113-1	O-RING, PLUNGER
6	81-A-5	ROLLER
7	81-A-40	BEARING
8	81-A-16	SHAFT, ROLLER
9	8-32 NC x 1/8	SOC. SET SCREW
10	81-A-17	GUIDE SCREW
11	4-A-80	WASHER
12	O-010-1	O-RING, DRAIN PORT
13	O-111-1	O-RING, SUB-PLATE



J.I.C. SYMBOL

LET.	DATE	REVISIONS	BY	CHK
A	5-25-64	WAS ASS'Y NO. 81-C-36, REDRAWN AND REVISED	WW A.	E.S.

MANATROL
A DIVISION OF THE PERRY-FAY CO.
200 PERRY CT. ELYRIA, OHIO

SCALE: FULL	APPROVED BY	DRAWN BY W. W. A.
DATE: 5-25-64	E.S. 6-12-64	REVISED

ASS'Y - DECELERATION VALVE, SUB-PLATE MTG. SIZE: 3/8

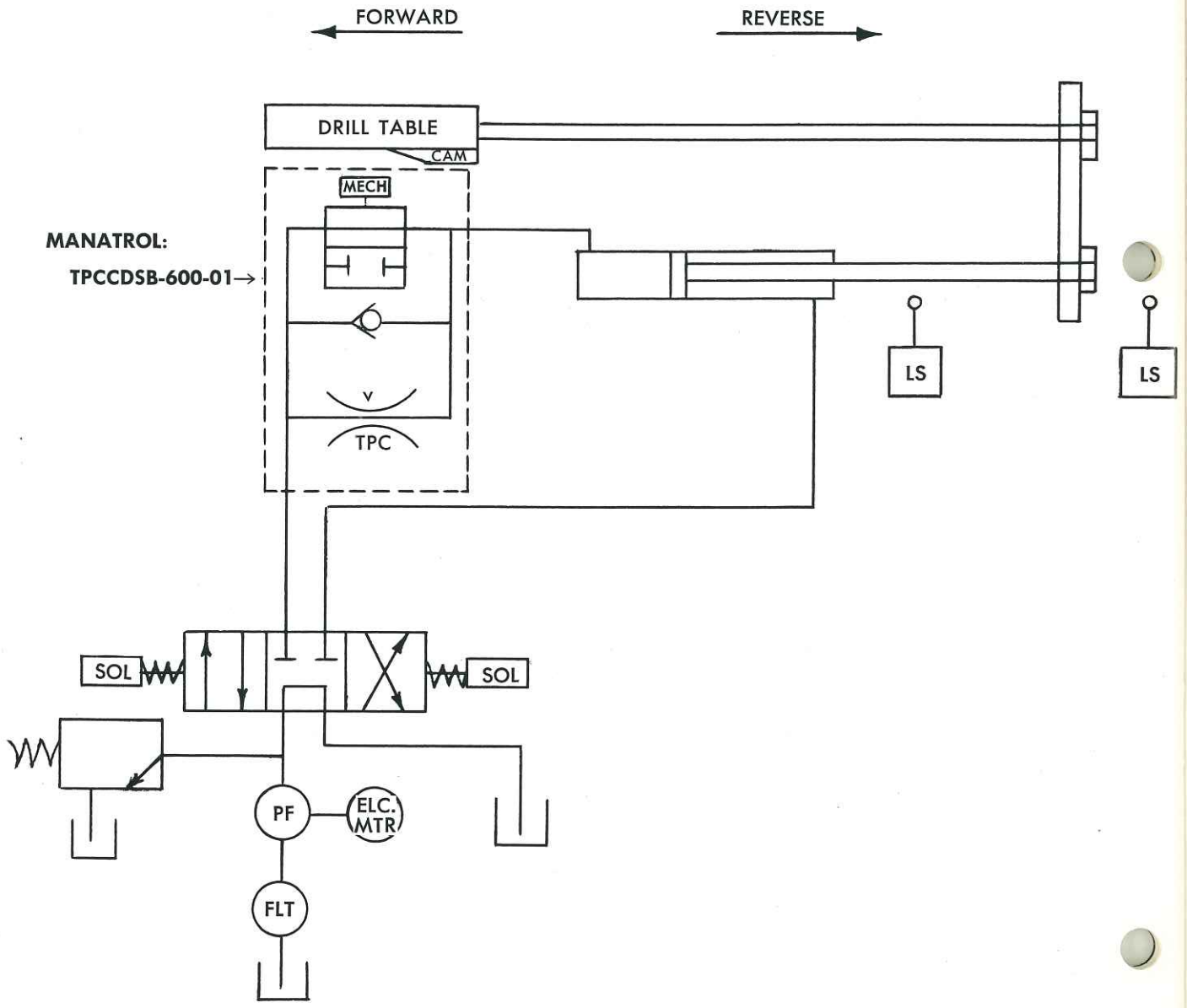
MODEL: DS-600

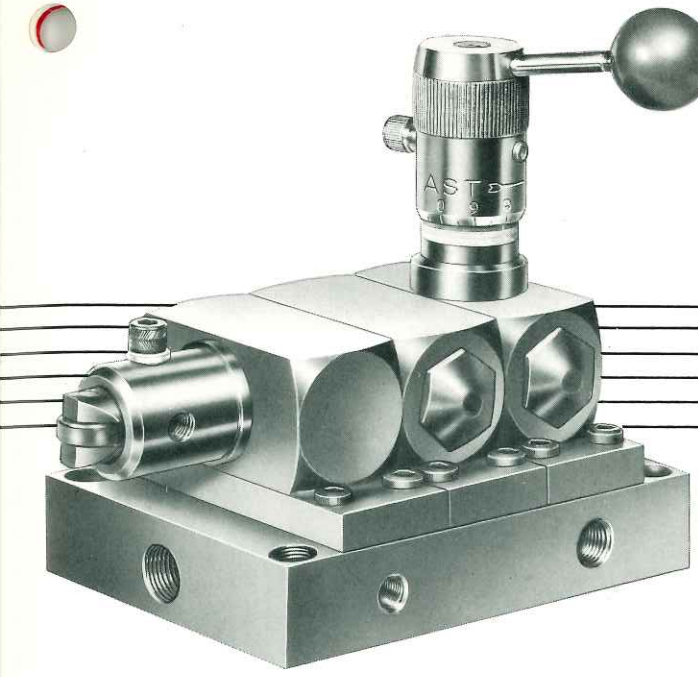
DRAWING NUMBER 203-C-228

TOLERANCE: UNLESS OTHERWISE SPECIFIED ALL FRACTIONAL DIM. ± .015"—ANGLES ± 2 DEGREE BREAK ALL SHARP EDGES. DO NOT SCALE DRAWINGS.

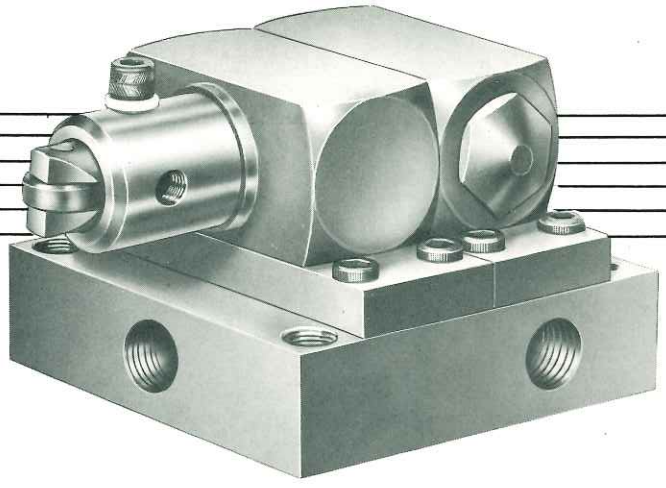
SAMPLE CIRCUIT FOR MANATROL TRAVERSE AND FEED CYCLE CONTROL PANELS

This circuit illustrates a typical application for Manatrol Valves in many machine tool operations. In this circuit, the drill table is required to have a fast feed forward up to the work piece where the Manatrol 2-way (DS-600) is actuated; fast feed is stopped and a fine feed is begun. The speed of the table during fine feed remains constant regardless of load or pressure fluctuations because of the Manatrol Temperature Pressure Compensated Valve (TPCS-600-01) As the machining operation is completed, the 4-way valve changes position and the table reverses rapidly via free flow through the Manatrol Check Valve (XCS-600).





PANEL TPCCDSB-600



PANEL DCSB-600

Panel TPCCDSB-600 consists of a Manatrol Deceleration Valve (DS-600), a Manatrol Check Valve (XCS-600), and a Manatrol Temperature Pressure Compensated Flow Control (TPCS-600).

This panel allows free flow in either direction until the plunger is depressed. When the plunger is depressed, a constant flow rate, regardless of temperature or pressure fluctuations, is maintained in one direction and free flow in the other. (see sample circuit on page 54). This panel accurately controls flow rates as low as 2.0 cubic inches per minute. The base plate has 3/8" NPTF ports and a maximum operating pressure of 2000 PSI with a maximum capacity of 6 GPM.

When ordering, specify the flow rate. (see chart "A" on page 54)

Panel DCSB-600 consists of a Manatrol Deceleration Valve (DS-600) and a Manatrol Check Valve (XCS-600).

This panel allows free flow in either direction until the plunger is depressed. When the plunger is depressed, free flow is permitted in one direction, and flow in the other direction is blocked.

The base plate as 3/8" NPTF ports and a maximum operating pressure of 2000 PSI.

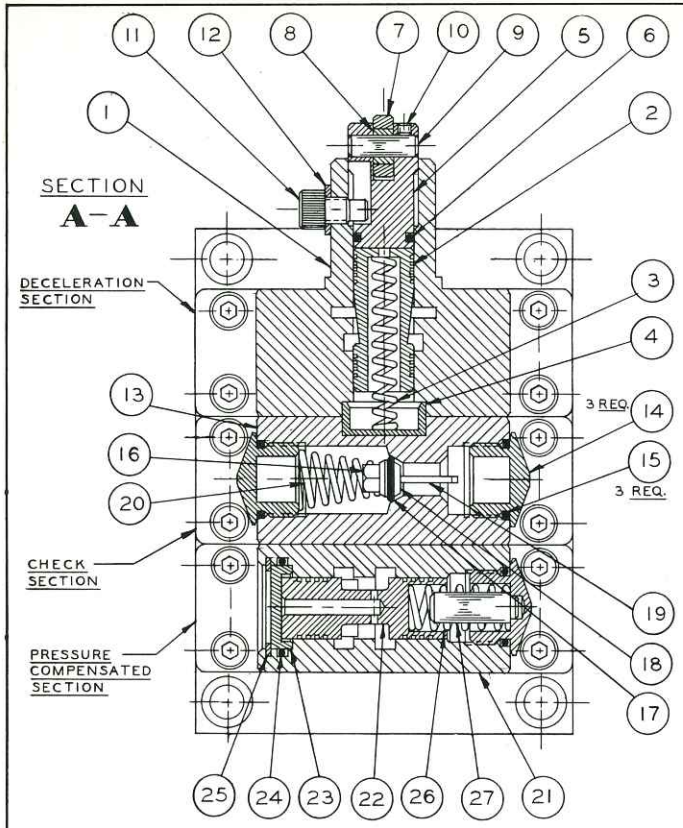
HOW TO ORDER

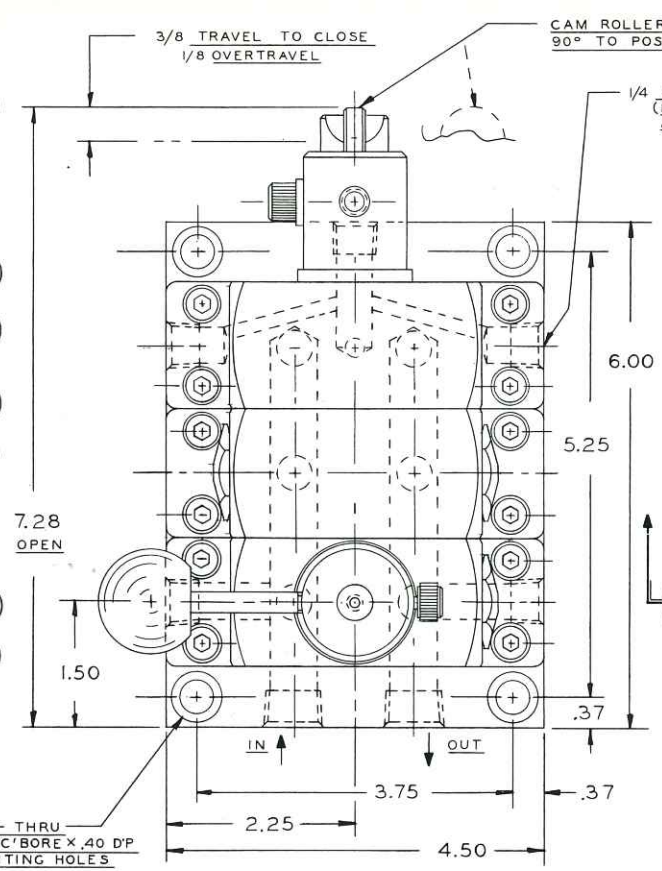
TPCCDSB - 600 - *

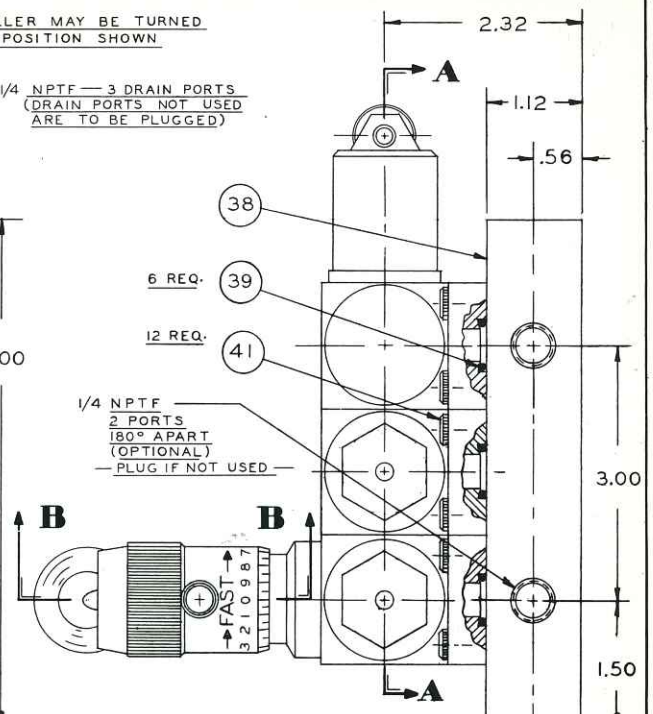
FLOW RATE

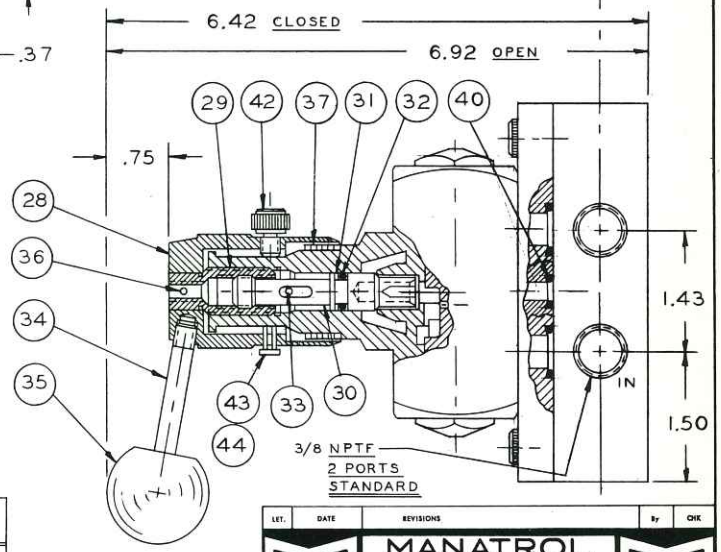
01 = 0 to 25 CIPM
02 = 0 to 50 CIPM
06 = 0 to 140 CIPM
3 = 0 to 3 GPM
6 = 0 to 6 GPM

DCSB - 600

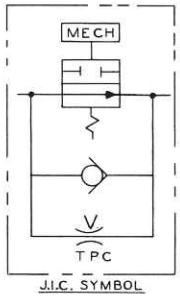








NOTES:
1. MATERIAL:
   O-RING & SEAL : BUNA-N
   BACK-UP RING : TEFLON
   BODY : STEEL
2. COMPENSATING PRESS. FROM 70 P.S.I. TO 3,000 P.S.I.
3. ⊛ A 5 MICRON FILTER IS REQUIRED FOR THESE VALVES



J.I.C. SYMBOL

NO.	PART NO.	DESCRIPTION
1	81-B-43	BODY - DECELERATION
2	81-A-3	PISTON
3	81-A-15	SPRING
4	81-A-10	PLUNGER CAP
5	81-A-4	PLUNGER
6	O-113-1	O-RING, PLUNGER
7	81-A-5	ROLLER
8	81-A-40	BEARING
9	81-A-16	SHAFT, ROLLER
10	8-32 NC×1/8	SOC. SET SCREW
11	81-A-17	GUIDE SCREW
12	4-A-80	WASHER
13	58-B-66	BODY - CHECK
14	58-A-63	END PLUG
15	00-10-2	O-RING, BODY
16	4-A-11	POPPET
17	4-A-31	POPPET SEAL
18	4-A-12	POPPET RETAINER
19	4-A-129	GUIDE BLADE
20	4-A-8	SPRING, POPPET
21	58-B-61	BODY - PRESS. COMP.
22	58-B-6	PISTON

NO.	PART NO.	DESCRIPTION
23	58-A-34	END PLUG
24	O-120-2	O-RING, BODY
25	58-A-35	RETAINING RING
26	58-A-16	SPRING, PISTON
27	58-A-17	STOP ROD
28	58-B-53	KNOB
29	58-A-48	ACTUATOR-OUTER
30	SEE CHART A	ORIFICE ACTUATOR
31	BU-011	BACK-UP RING
32	O-011-1	O-RING
33	58-A-55	PIN, ACTUATOR
34	58-A-27	ROD, HANDLE
35	58-A-40	BALL, HANDLE
36	58-A-54	LOCKPIN, ACTUATOR
37	10-A-7	MARKING WASHERS
38	81-B-27	BASE PLATE (MP-603)
39	O-111-1	O-RING, BASE PLATE
40	O-010-1	O-RING, DRAIN PORT
41	5/16-18×7/8	SOC. HD. CAP SCREW
42	58-A-15	LOCKSCREW
43	58-A-22	LOCKPIN, KNOB
44	8-32 NC×1/4	SETSCREW

CHART A
NEEDLE SPECIFICATION

FLOW RATE CU.IN./MIN.	FLOW RATE G.P.M.	NEEDLE PART NO.	MODEL NO.
⊛ 0 - 25	0.1	58-A-59	-600-01
⊛ 0 - 50	0.2	58-A-58	-600-02
0 - 140	0.6	58-A-49	-600-06
0 - 700	3.0	58-A-56	-600-3
0 - 1400	6.0	58-A-57	-600-6

SECTION
B-B

TOLERANCE: UNLESS OTHERWISE SPECIFIED ALL FRACTIONAL DIM. ± .015"—ANGLES ± 2 DEGREE BREAK ALL SHARP EDGES. DO NOT SCALE DRAWINGS.

LET.	DATE	REVISIONS	By	CHK

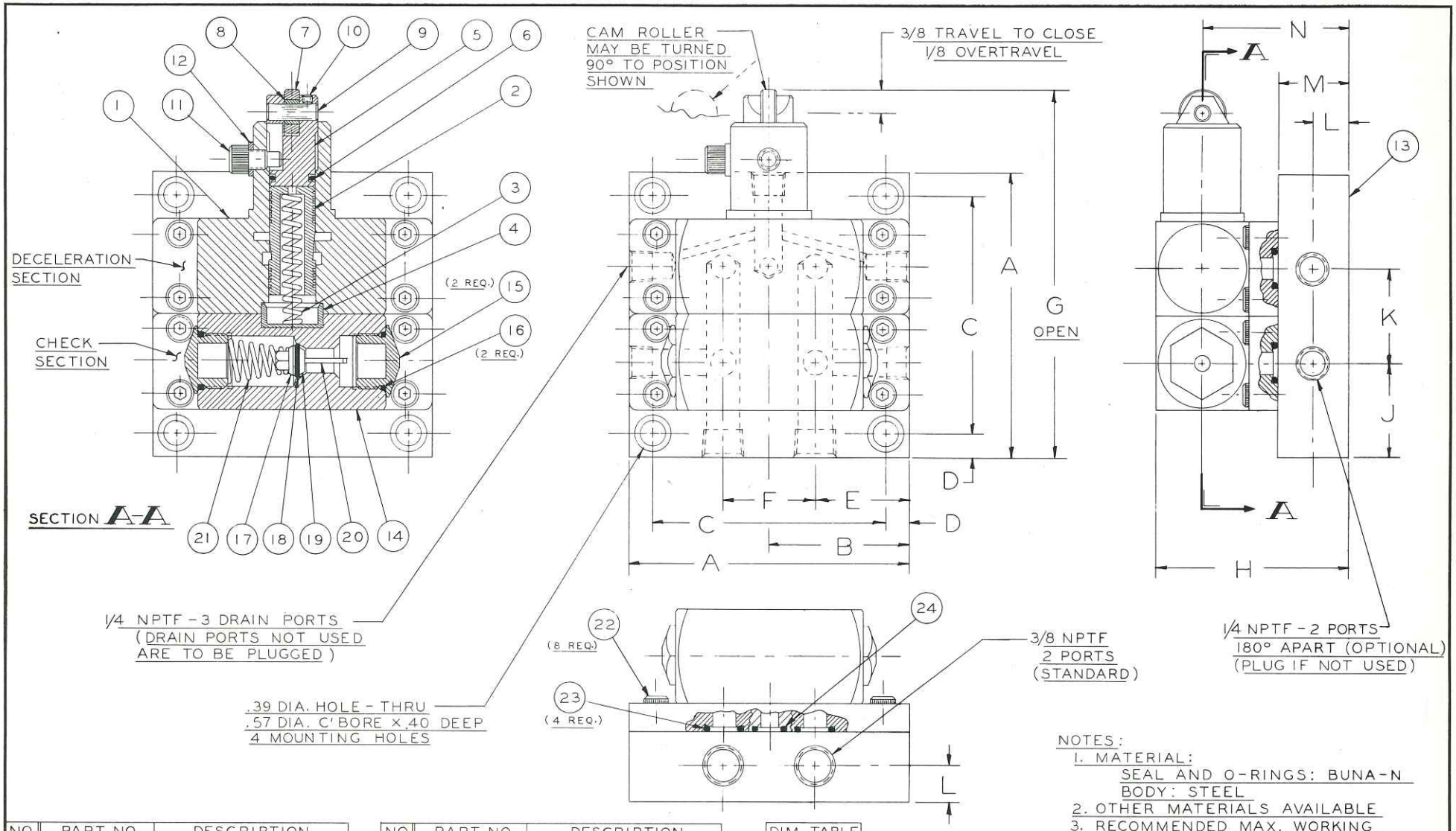
MANATROL
A DIVISION OF THE PERRY-FAY CO.
200 PERRY ST. ELYRIA, OHIO

SCALE: FULL
DATE: 5-4-64
APPROVED BY E.S. 6-10-64
DRAWN BY W.M.A.
REVISED

ASS'Y — SUB-PLATE MT'D DECELERATION, CHECK, & TEMP. PRESS. COMP. VALVE W/SUB-PLATE, SIZE: 3/8

MODEL: TPCCDSB-600

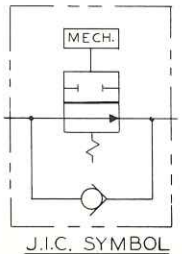
DRAWING NUMBER 203-C-222



NO.	PART NO.	DESCRIPTION
1	81-B-43	BODY-DECELERATION
2	81-A-3	PISTON
3	81-A-15	SPRING
4	81-A-10	PLUNGER CAP
5	81-A-4	PLUNGER
6	O-113-1	O-RING, PLUNGER
7	81-A-5	ROLLER
8	81-A-40	BEARING
9	81-A-16	SHAFT, ROLLER
10	8-32 NC x 1/8	SOC. SET SCREW
11	81-A-17	GUIDE SCREW
12	4-A-80	WASHER
13	81-B-28	BASE PLATE (MP-602)

NO.	PART NO.	DESCRIPTION
14	58-B-66	BODY - CHECK
15	58-A-63	END PLUG
16	O-120-2	O-RING, BODY
17	4-A-11	POPPET
18	4-A-31	POPPET SEAL
19	4-A-12	POPPET RETAINER
20	4-A-129	GUIDE BLADE
21	4-A-8	SPRING, POPPET
22	5/16-18 x 7/8	SOC. HD CAP SCR
23	O-111-1	O-RING, BASE PLATE
24	O-010-1	O-RING, DRAIN PORT

DIM. TABLE LET.	DIM.
A	4.50
B	2.25
C	3.75
D	.37
E	1.70
F	1.09
G	5.78
H	3.07
J	1.50
K	1.50
L	.56
M	1.12
N	2.32



J.I.C. SYMBOL

NOTES:
1. MATERIAL:
SEAL AND O-RINGS: BUNA-N
BODY: STEEL
2. OTHER MATERIALS AVAILABLE
3. RECOMMENDED MAX. WORKING PRESSURE IS 3,000 P.S.I.

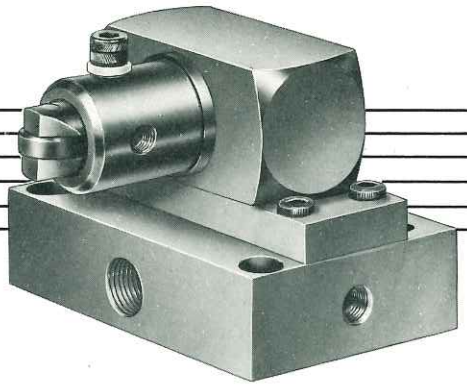
MANATROL
A DIVISION OF THE PERRY-FAY CO.
200 PERRY CT. ELYRIA, OHIO

SCALE: FULL
DATE: 11-22-63
APPROVED BY E.S. 6-9-64
DRAWN BY W.W.A.
REVISED

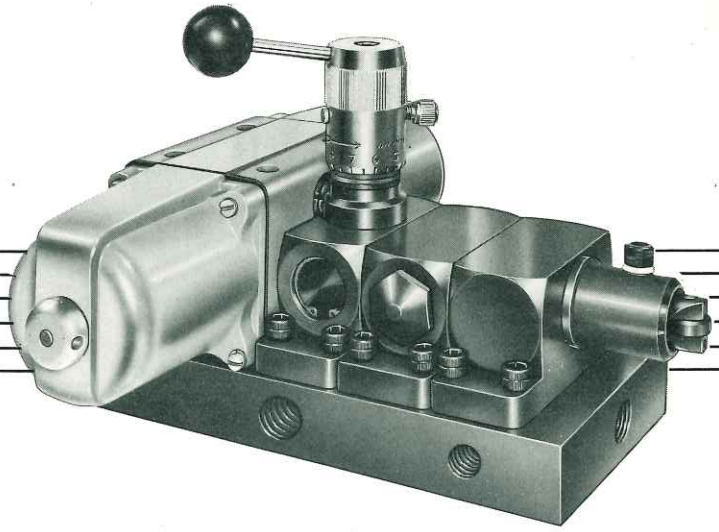
ASS'Y—SUB-PLATE MT'D DECERATION & CHECK VALVE W/SUB-PLATE, SIZE: 3/8

MODEL: DCSB-600

DRAWING NUMBER 203-C-143



PANEL DSB-600



PANEL TPCCDSB4-600

Panel DSB-600 consists of a Manatrol Deceleration Valve (DS-600) mounted on a baseplate. This panel permits free flow in either direction until the plunger is depressed. When the plunger is depressed, flow in both directions is blocked.

The base plate has ⅜"NPTF ports and a maximum operating pressure of 2000 PSI.

Panel TPCCDSB4-600 consists of the same valve as the panel TPCCDSB-600 with the exception that space is provided to add any **ONE** of the many directional valves which are available.

This panel offers the ultimate for use in hydraulic circuits for controlling "Rapid traverse and feed" cycles.

The base plate has ⅜" NPTF ports, maximum operating pressure of 2000 PSI and a maximum capacity of 6 GPM. When ordering, specify flow rate. (see Chart A on page 34.)

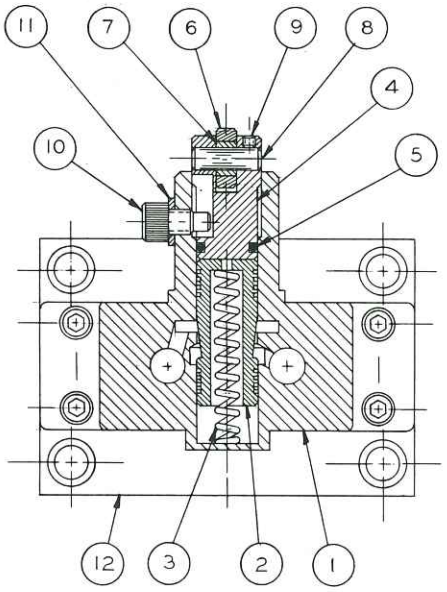
HOW TO ORDER

DSB - 600

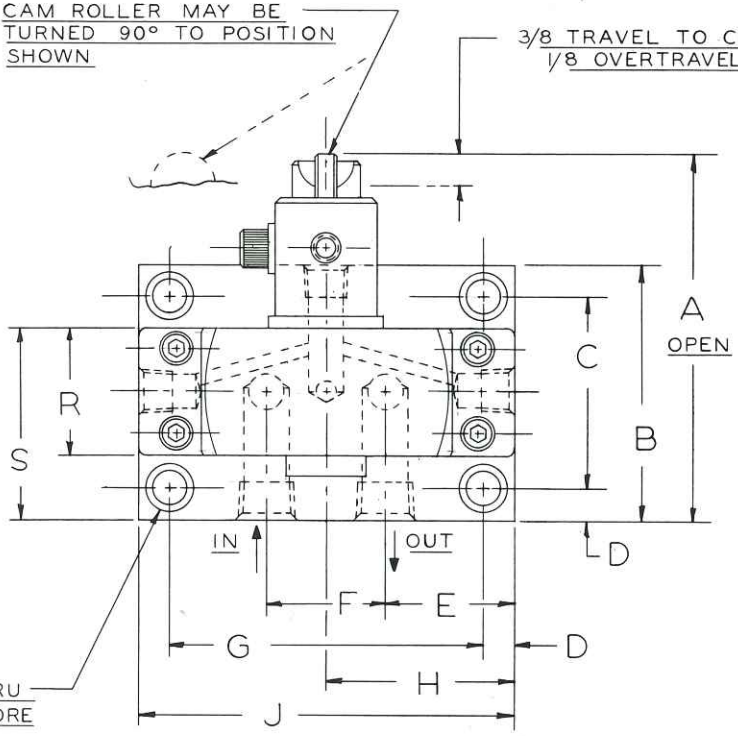
TPCCDSB4 - 600 - *

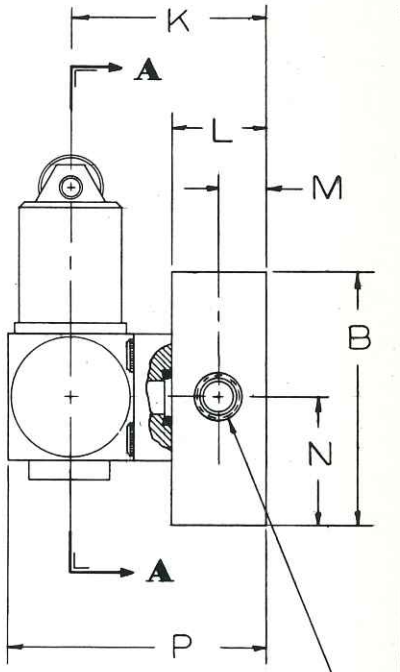
FLOW RATE

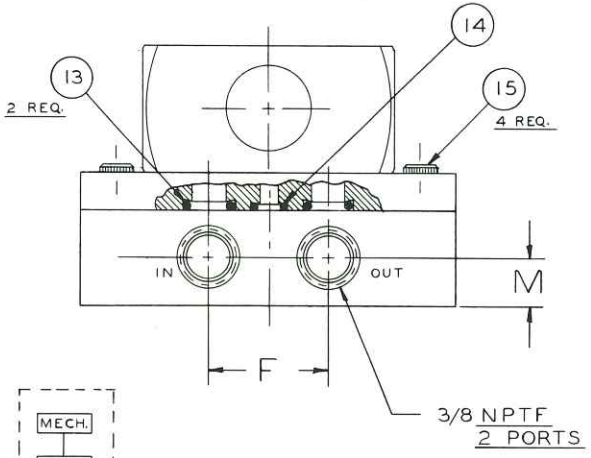
01 = 0 to 25 CIPM
02 = 0 to 50 CIPM
06 = 0 to 140 CIPM
3 = 0 to 3 GPM
6 = 0 to 6 GPM

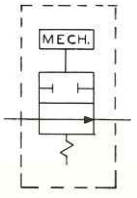


SECTION **A-A**









J.I.C. SYMBOL

NO.	PART NO.	DESCRIPTION
1	81-B-43	BODY
2	81-A-3	PISTON
3	81-A-15	SPRING
4	81-A-4	PLUNGER
5	O-113-1	O-RING, PLUNGER
6	81-A-5	ROLLER
7	81-A-40	BEARING
8	81-A-16	SHAFT, ROLLER
9	8-32NCx1/8	SOC. SET SCREW
10	81-A-17	GUIDE SCREW
11	4-A-80	WASHER
12	81-B-42	BASE PLATE (MP-601)
13	O-111-1	O-RING, BASE PLATE
14	O-010-1	O-RING, DRAIN PORT
15	5/16-18x7/8	SOC. HD CAP SCREW

DIM. TABLE	
LET.	DIM.
A	4.28
B	3.00
C	2.25
D	.37
E	1.53
F	1.43
G	3.75
H	2.25
J	4.50
K	2.32
L	1.12
M	.56
N	1.50
P	3.07
R	1.50
S	2.25

NOTES:
1. MATERIAL:
O-RINGS: BUNA-N
BODY: STEEL
2. RECOMMENDED MAX. WORKING PRESSURE IS 3,000 P.S.I.

TOLERANCE: UNLESS OTHERWISE SPECIFIED ALL FRACTIONAL DIM. ± .015"—ANGLES ± 2 DEGREE BREAK ALL SHARP EDGES. DO NOT SCALE DRAWINGS.

LET.	DATE	REVISIONS	BY	CHK

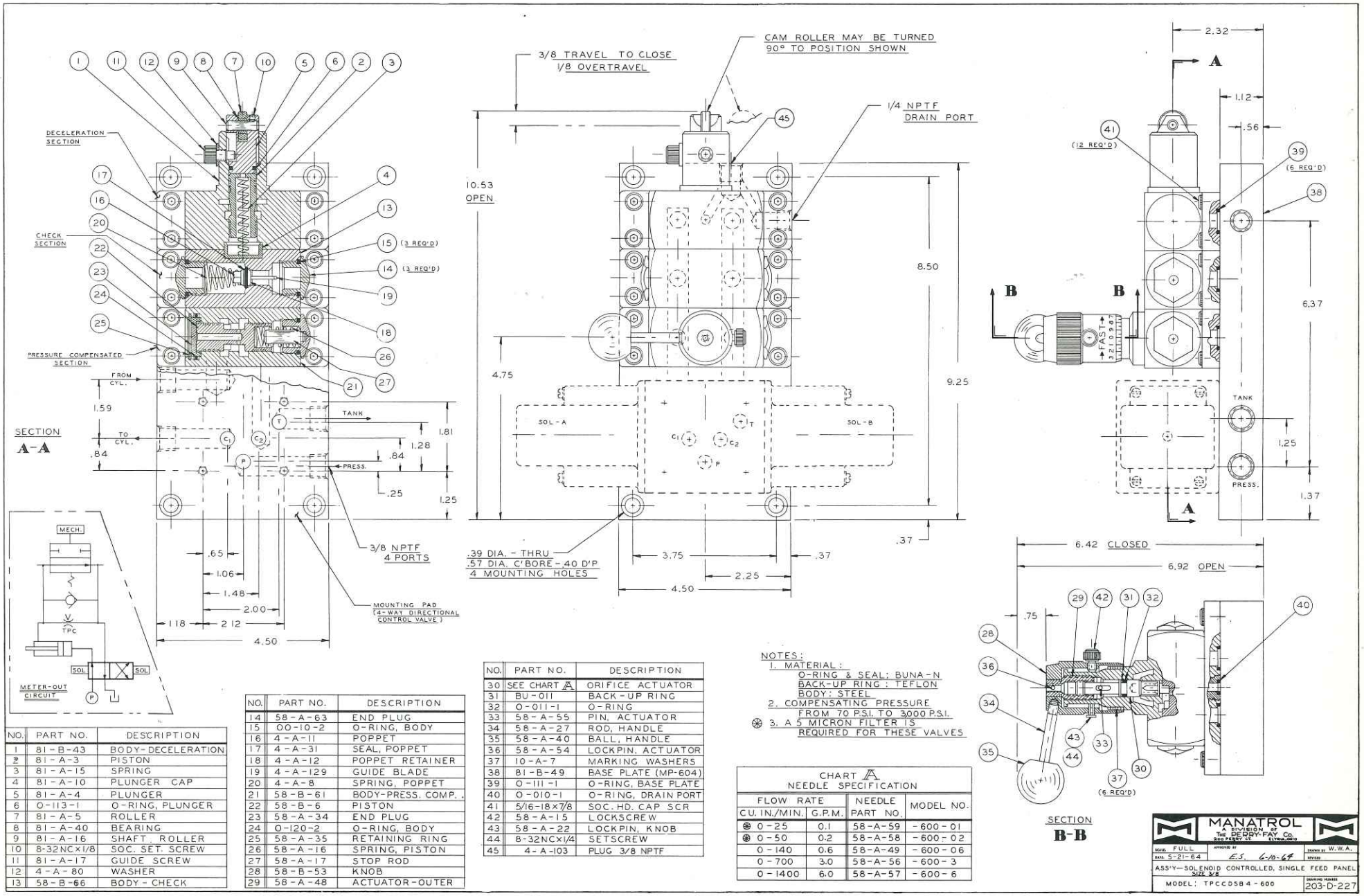
MANATROL
A DIVISION OF THE PERRY-FAY CO.
200 PERRY CT. ELYRIA, OHIO

SCALE: FULL
DATE: 5-8-64
APPROVED BY: E.S. 6-9-64
DRAWN BY: W.W.A.
REVISED:

ASSY-SUB-PLATE MOUNTED DECELERATION VALVE WITH SUB-PLATE SIZE 3/8

MODEL: DSB-600

DRAWING NUMBER: 203-C-223



NO.	PART NO.	DESCRIPTION
1	81-B-43	BODY-DECELERATION
2	81-A-3	PISTON
3	81-A-15	SPRING
4	81-A-10	PLUNGER CAP
5	81-A-4	PLUNGER
6	O-113-1	O-RING, PLUNGER
7	81-A-5	ROLLER
8	81-A-40	BEARING
9	81-A-16	SHAFT, ROLLER
10	8-32NCX1/8	SOC. SET. SCREW
11	81-A-17	GUIDE SCREW
12	4-A-80	WASHER
13	58-B-66	BODY-CHECK

NO.	PART NO.	DESCRIPTION
14	58-A-63	END PLUG
15	00-10-2	O-RING, BODY
16	4-A-11	POPPET
17	4-A-31	SEAL, POPPET
18	4-A-12	POPPET RETAINER
19	4-A-129	GUIDE BLADE
20	4-A-8	SPRING, POPPET
21	58-B-61	BODY-PRESS. COMP.
22	58-B-6	PISTON
23	58-A-34	END PLUG
24	O-120-2	O-RING, BODY
25	58-A-35	RETAINING RING
26	58-A-16	SPRING, PISTON
27	58-A-17	STOP ROD
28	58-B-53	KNOB
29	58-A-48	ACTUATOR-OUTER

NO.	PART NO.	DESCRIPTION
30	SEE CHART Ⓐ	ORIFICE ACTUATOR
31	BU-011	BACK-UP RING
32	O-011-1	O-RING
33	58-A-55	PIN, ACTUATOR
34	58-A-27	ROD, HANDLE
35	58-A-40	BALL, HANDLE
36	58-A-54	LOCKPIN, ACTUATOR
37	10-A-7	MARKING WASHERS
38	81-B-49	BASE PLATE (MP-604)
39	O-111-1	O-RING, BASE PLATE
40	O-010-1	O-RING, DRAIN PORT
41	5/16-18x7/8	SOC. HD. CAP SCR
42	58-A-15	LOCKSCREW
43	58-A-22	LOCKPIN, KNOB
44	8-32NCx1/4	SETSCREW
45	4-A-103	PLUG 3/8 NPTF

NOTES:
1. MATERIAL:
   O-RING & SEAL: BUNA-N
   BACK-UP RING: TEFLON
   BODY: STEEL
2. COMPENSATING PRESSURE FROM 70 P.S.I. TO 3,000 P.S.I.
⊛ 3. A 5 MICRON FILTER IS REQUIRED FOR THESE VALVES

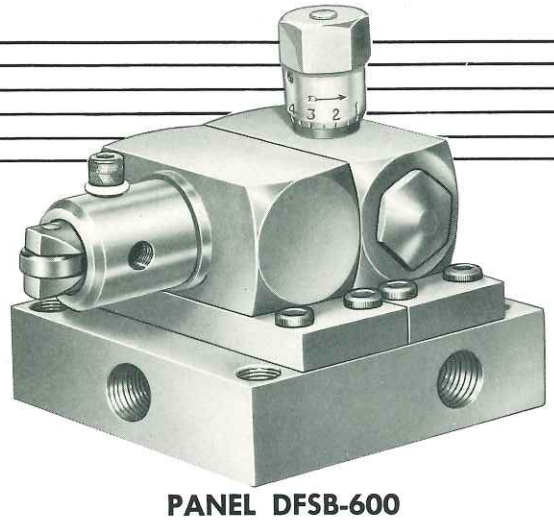
CHART Ⓐ
NEEDLE SPECIFICATION

FLOW RATE		NEEDLE	MODEL NO.
CU. IN./MIN.	G.P.M.	PART NO.	
⊛ 0-25	0.1	58-A-59	-600-01
⊛ 0-50	0.2	58-A-58	-600-02
0-140	0.6	58-A-49	-600-06
0-700	3.0	58-A-56	-600-3
0-1400	6.0	58-A-57	-600-6

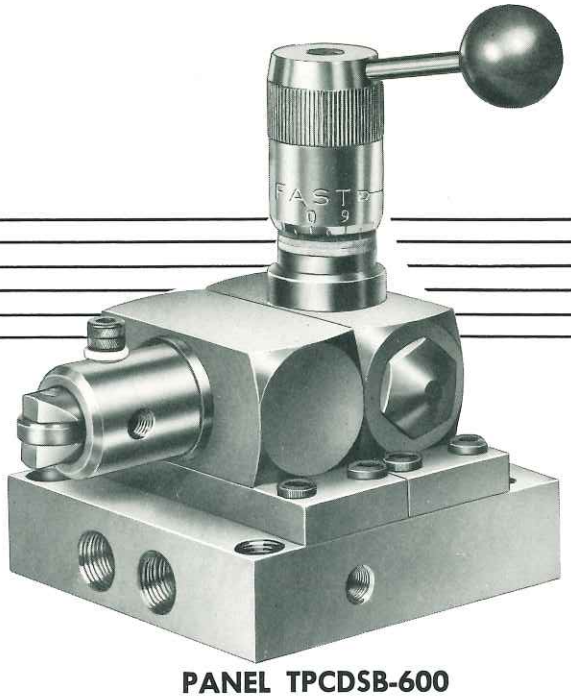
MANATROL
A DIVISION OF THE DEPPY-FAY CO.
300 PERRY ST. ELYRIA, OHIO

SCALE: FULL	APPROVED BY: E.S. 6-10-64	DRAWN BY: W.W.A.
DATE: 5-21-64		REVISED

A55'Y-SOLENOID CONTROLLED, SINGLE FEED PANEL
SIZE 3/8
MODEL: TPCCDS84-600
DRAWING NUMBER 203-D-227



PANEL DFSB-600



PANEL TPCDSB-600

Panel DFSB-600 consists of a Manatrol Deceleration Valve (DS-600) and a Manatrol Flow Control Valve (XFS-600).

This Panel allows free flow in either direction until the plunger is depressed. When the plunger is depressed, free flow is permitted in one direction and controlled flow in the other.

The base plate has ⅜" NPTF ports and a maximum operating pressure of 2000 PSI.

Panel TPCDSB-600 consists of a Manatrol Deceleration Valve (DS-600) and a Manatrol Temperature Pressure Compensated Flow Control Valve (TPCS-600). Free flow is allowed in either direction until the plunger is depressed. When the plunger is depressed, a **CONSTANT** temperature pressure compensated flow is permitted in one direction and flow is blocked in the other.

The base plate has ⅜" NPTF ports with a maximum operating pressure of 2000 PSI and a maximum flow rate of 6 GPM. When ordering specify flow rate. (see Chart A on page 34.)

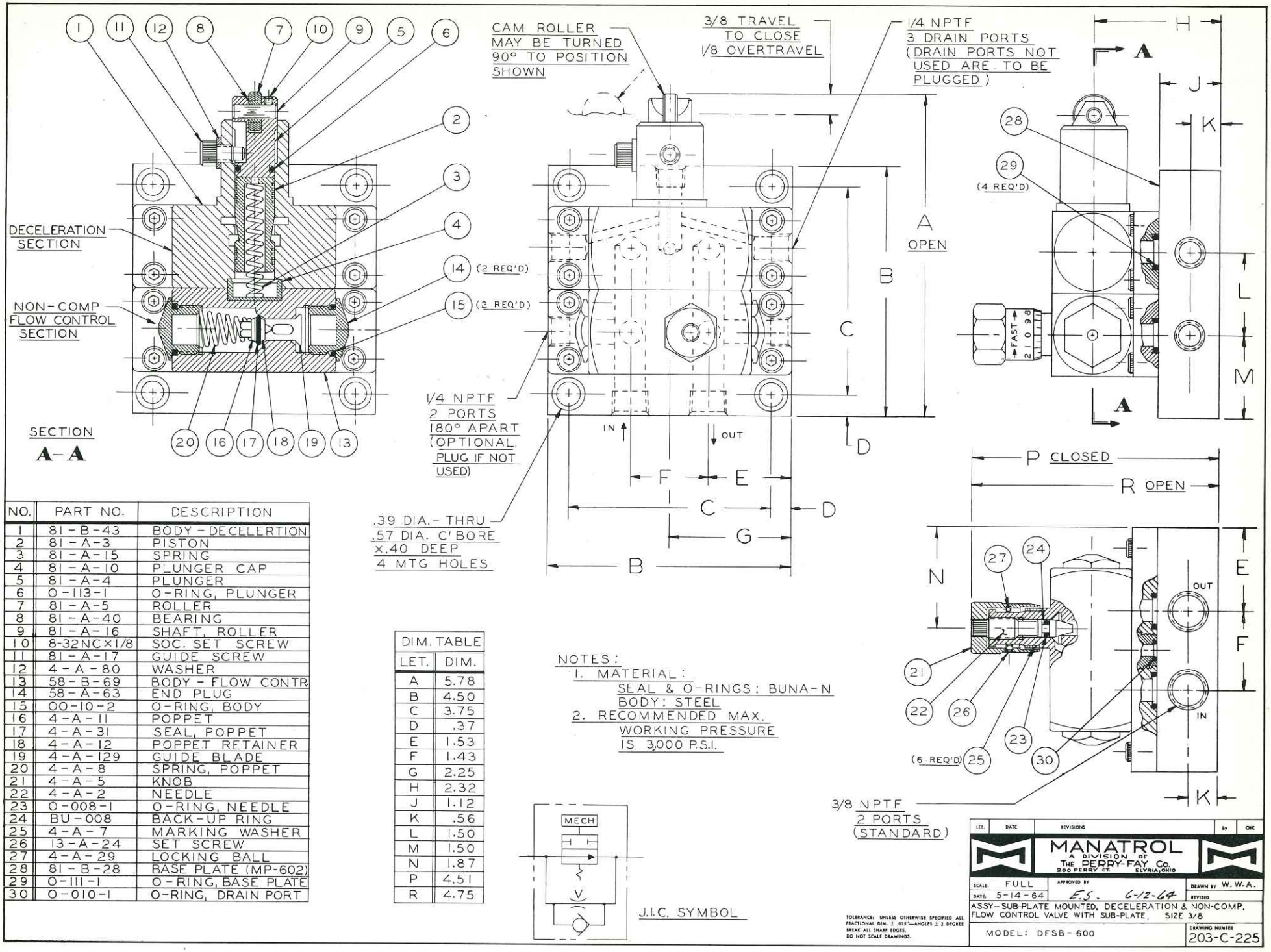
HOW TO ORDER

DSFB-600

TPCDSB - 600 - *

FLOW RATE

01 = 0 to 25 CIPM
02 = 0 to 50 CIPM
06 = 0 to 140 CIPM
3 = 0 to 3 GPM
6 = 0 to 6 GPM



NO.	PART NO.	DESCRIPTION
1	81-B-43	BODY - DECELERTION
2	81-A-3	PISTON
3	81-A-15	SPRING
4	81-A-10	PLUNGER CAP
5	81-A-4	PLUNGER
6	O-113-1	O-RING, PLUNGER
7	81-A-5	ROLLER
8	81-A-40	BEARING
9	81-A-16	SHAFT, ROLLER
10	8-32NC×1/8	SOC. SET SCREW
11	81-A-17	GUIDE SCREW
12	4-A-80	WASHER
13	58-B-69	BODY - FLOW CONTR.
14	58-A-63	END PLUG
15	00-10-2	O-RING, BODY
16	4-A-11	POPPET
17	4-A-31	SEAL, POPPET
18	4-A-12	POPPET RETAINER
19	4-A-129	GUIDE BLADE
20	4-A-8	SPRING, POPPET
21	4-A-5	KNOB
22	4-A-2	NEEDLE
23	O-008-1	O-RING, NEEDLE
24	BU-008	BACK-UP RING
25	4-A-7	MARKING WASHER
26	13-A-24	SET SCREW
27	4-A-29	LOCKING BALL
28	81-B-28	BASE PLATE (MP-602)
29	O-111-1	O-RING, BASE PLATE
30	O-010-1	O-RING, DRAIN PORT

DIM. TABLE	
LET.	DIM.
A	5.78
B	4.50
C	3.75
D	.37
E	1.53
F	1.43
G	2.25
H	2.32
J	1.12
K	.56
L	1.50
M	1.50
N	1.87
P	4.51
R	4.75

NOTES:
1. MATERIAL:
   SEAL & O-RINGS: BUNA-N
   BODY: STEEL
2. RECOMMENDED MAX. WORKING PRESSURE IS 3,000 P.S.I.

TOLERANCE: UNLESS OTHERWISE SPECIFIED ALL FRACTIONAL DIM. ± .015"—ANGLES ± 2 DEGREE BREAK ALL SHARP EDGES. DO NOT SCALE DRAWINGS.

LET.	DATE	REVISIONS	BY	CHK

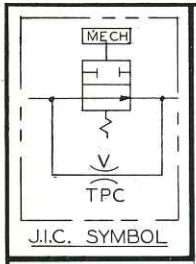
MANATROL
A DIVISION OF THE PERRY-FAY CO.
200 PERRY CT. ELYRIA, OHIO

SCALE: FULL
DATE: 5-14-64
APPROVED BY: E.S. 6-12-64
DRAWN BY: W. W. A.
REVISED:

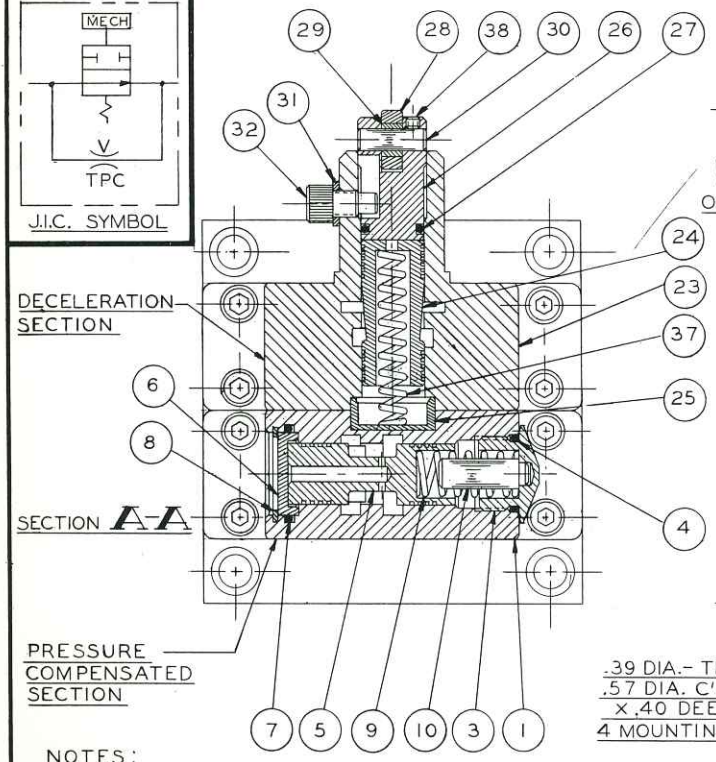
ASSY-SUB-PLATE MOUNTED, DECELERATION & NON-COMP. FLOW CONTROL VALVE WITH SUB-PLATE, SIZE 3/8

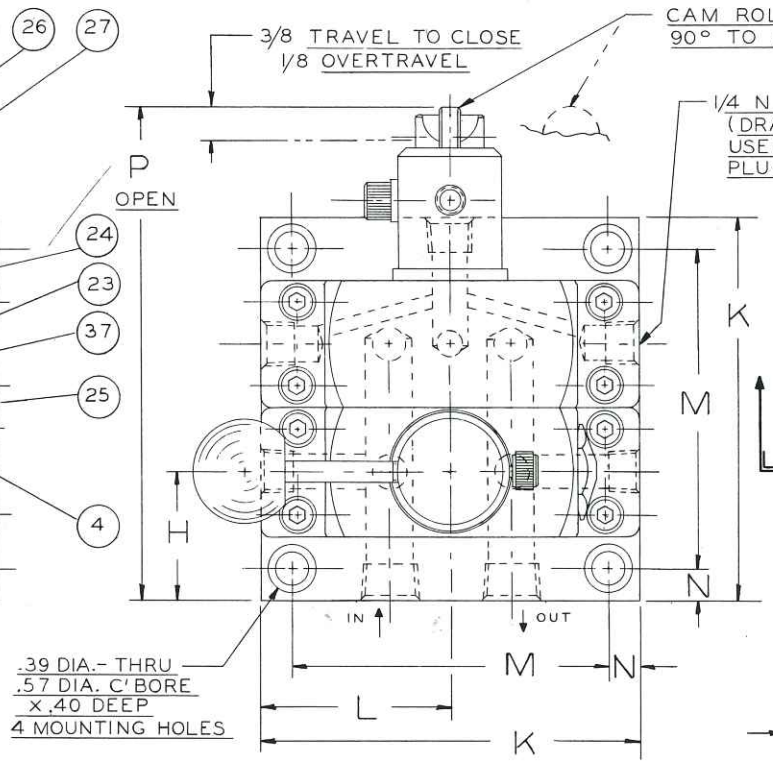
MODEL: DFSB-600

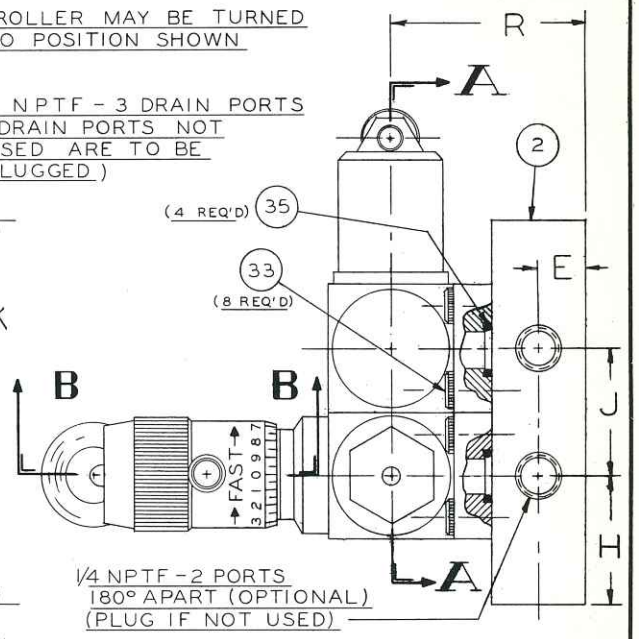
DRAWING NUMBER: 203-C-225

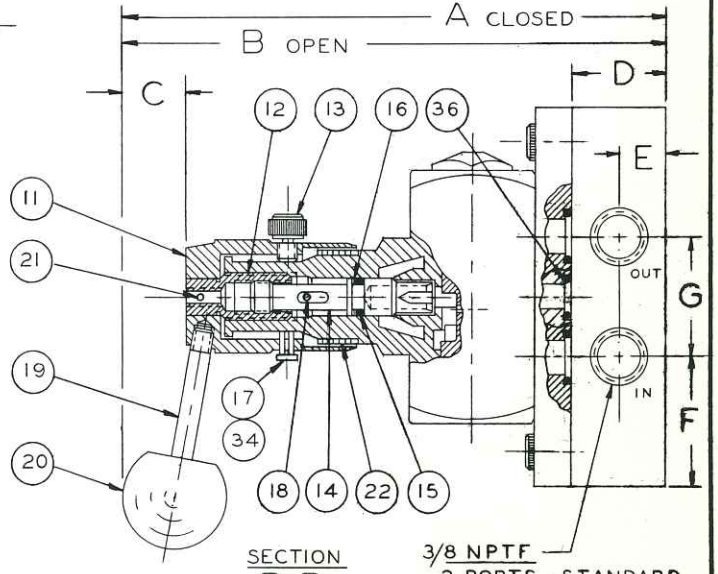


J.I.C. SYMBOL









NOTES:
1. MATERIAL:
   O-RINGS: BUNA-N
   BACK-UP RING: TEFLON
   BODY: STEEL
2. OTHER MATERIALS AVAILABLE
3. COMPENSATING PRESSURE FROM 70 P.S.I. TO 3,000 P.S.I.
⊛ 4. A 5 MICRON FILTER IS REQUIRED FOR THESE VALVES

NO.	PART NO.	DESCRIPTION
1	58-B-74	BODY-PRESS. COMP.
2	81-B-28	BASE PLATE (MP-602)
3	58-A-63	END PLUG
4	00-10-2	O-RING, END PLUG
5	58-B-6	PISTON
6	58-A-34	END PLUG
7	0-120-2	O-RING, BODY
8	58-A-35	RETAINING RING
9	58-A-16	SPRING, PISTON
10	58-A-17	STOP ROD
11	58-B-53	KNOB
12	58-A-48	ACTUATOR-OUTER
13	58-A-15	LOCKSCREW
14	CHART "A"	ORIFICE ACTUATOR
15	0-011-1	O-RING.
16	BU-011	BACK-UP RING
17	58-A-22	LOCKPIN, KNOB
18	58-A-55	PIN, ACTUATOR
19	58-A-27	ROD, HANDLE
20	58-A-40	BALL, HANDLE

NO.	PART NO.	DESCRIPTION
21	58-A-54	LOCKPIN, ACTUATOR
22	10-A-7	MARKING WASHERS
23	81-B-43	BODY - DECELERATION
24	81-A-3	PISTON
25	81-A-10	PLUNGER CAP
26	81-A-4	PLUNGER
27	0-113-1	O-RING, PLUNGER
28	81-A-5	ROLLER
29	81-A-40	BEARING
30	81-A-16	SHAFT, ROLLER
31	4-A-80	WASHER
32	81-A-17	GUIDE SCREW
33	5/16-18NCx7/8	SOC. HD. CAP SCREW
34	8-32 NCx1/4	SOC. SET-SCREW
35	0-111-1	O-RING, BASE PLATE
36	0-010-1	O-RING, DRAIN PORT
37	81-A-15	SPRING
38	8-32 NCx1/8	SOC. SET SCREW

DIM. TABLE	
LET.	DIM.
A	6.42
B	6.92
C	.75
D	1.12
E	.56
F	1.50
G	1.43
H	1.50
J	1.50
K	4.50
L	2.25
M	3.75
N	.37
P	5.78
R	2.32

CHART A
NEEDLE SPECIFICATION

FLOW RATE CU.IN./MIN.	FLOW RATE G.P.M.	NEEDLE PART NO.	MODEL NO.
⊛ 0 - 25	0.1	58-A-59	- 600-01
⊛ 0 - 50	0.2	58-A-58	- 600-02
0 - 140	0.6	58-A-49	- 600-06
0 - 700	3.0	58-A-56	- 600-3
0 - 1400	6.0	58-A-57	- 600-6

MANATROL
A DIVISION OF THE PERRY-FAY CO.
200 PERRY CT. ELYRIA, OHIO

SCALE: FULL
DATE: 11-19-63
APPROVED BY: 12-19-63
DRAWN BY: W.W.A.
REVISED:

ASS'Y — DECELERATION AND TEMPERATURE PRESS. COMPENSATED VALVE W/SUB-PLATE, SIZE: 3/8

MODEL: TPCDSB-600

DRAWING NUMBER: 203-C-140

ALABAMA
Birmingham: Activation, Inc.

ARIZONA
Phoenix: Air Draulics

CALIFORNIA
Oakland: Ditzen Engineering
Los Angeles: Teglen Engineering Co.
Fresno: Teisinger & Son
San Diego: Ditzen Engineering

COLORADO
Denver: The Wild Co.

CONNECTICUT
Bridgeport: Knox, Inc.

FLORIDA
Tampa: Adams Air & Hydraulics

GEORGIA
Atlanta: Equipment Sales

HAWAII
Honolulu: Hawaiian Fluid Power Co.

ILLINOIS
Chicago: Walter Norris Engineering Co.
Moline: Walter Norris Engineering Co.
Rockford: Walter Norris Engineering Co.

INDIANA
Fort Wayne: Neff Engineering Co.
Indianapolis: Neff Engineering Co.
South Bend: Neff Engineering Co.

IOWA
Cedar Rapids: Walter Norris Engineering Co.
Des Moines: Walter Norris Engineering Co.

KENTUCKY
Louisville: Scott Industrial Equipment

LOUISIANA
Baton Rouge: Pneumatic & Hydraulic Co.

MARYLAND
Baltimore: N. B. Cochrane Co.

MASSACHUSETTS
East Walpole: Knox, Inc.
West Springfield: Knox, Inc.

MICHIGAN
Detroit: Kerns-Morrell Company

MINNESOTA
Minneapolis: E. F. Klumb & Associates

MISSOURI
St. Louis: Sturgis Equipment Co.
Kansas City: Sturgis Equipment

NEW JERSEY
Cranford: The Roden Company

NEW YORK
Albany: Ralph W. Earl Co.
Buffalo: Goll Corp.
Great Neck: Hydra-Tec Corp.
Syracuse: Ralph W. Earl Co.

NORTH CAROLINA
Charlotte: Jett Engineering

OHIO
Cincinnati: Scott Equipment Co.
Cleveland: Lax Industrial Products Inc.
Columbus: Scott Equipment Co.
Dayton: Scott Equipment Co.

OKLAHOMA
Oklahoma City: Nix Supply Co.
Tulsa: Nix Supply Co.

OREGON
Portland: Hydraulic & Air Equipment Co.
Medford: Hydraulic & Air Equipment Co.

PENNSYLVANIA
Erie: Ralph Hiller Co.
Philadelphia: Fluid Power Inc.
Pittsburgh: Ralph Hiller Co.

TENNESSEE
Memphis: Air Draulics Engineering Co.

TEXAS
Dallas: Womack Machine Supply
Fort Worth: Womack Machine Supply
Houston: Womack Machine Supply

WASHINGTON
Seattle: Hydraulic & Air Equipment Co.
Spokane: Hydraulic & Air Equipment Co.

WISCONSIN
Milwaukee: Neff Engineering

PUERTO RICO
Rio Piedras: Fenning Engineering

COLORFLOW
Control Valve
MANATROL

Designers and
manufacturers of
hydraulic and
pneumatic equipment.

MDPF 7164

Litho in U.S.A.

PRICE LIST "A"

MANATROL

A Division of Perry-Fay Co.

200 PERRY COURT ELYRIA, OHIO 44035

Phone: 322-4631
Area Code 216

IN BALTIMORE STOCK
CALL HOPKINS 7-4884

IMPORTANT VALVES PRICED ON PRICE LIST (A) MAY BE COMBINED IN ORDER TO EARN THE LARGEST DISCOUNT

Discount Schedule	
1-9	List
10-24	5%
25-49	10%
50-99	15%
100 & Up	20%

Effective Date July 1, 1964

Seals—Standard Seals on all Steel and Brass Valves are Buna "N"
Standard Seals on all Stainless Steel Valves are Viton.
All Seals deviating from these Specs. will be priced in the following manner:

Valve Size	Added Cost
1/8"-1/2" Incl.	2.00
3/4"-1 1/2" Incl.	2.75
1 1/2"-2" Incl.	3.50

"F" SERIES MANATROL FLOW CONTROL VALVES

PIPE SIZE	MODEL NO.	BRASS	STEEL	303 STAIN-LESS STEEL	316 STAIN-LESS STEEL
1/8"	F-200	4.25	4.80	14.40	17.40
1/8"	4F-200	4.80	5.35	15.30	18.40
1/4"	F-400	5.35	6.15	18.60	26.00
3/8"	F-600	7.15	8.20	24.40	33.30
1/2"	F-800	9.70	10.05	30.20	41.90
3/4"	F-1200	13.50	13.70	41.10	56.20
1"	F-1600	56.00	39.90	131.70	159.60
1 1/4"	F-2000		52.20		

"N" SERIES MANATROL NEEDLE VALVES

PIPE SIZE	MODEL NO.	BRASS	STEEL	303 STAIN-LESS STEEL	316 STAIN-LESS STEEL
1/8"	N-200	3.60	4.60	13.00	14.10
1/8"	4N-200	4.20	5.10	13.90	15.00
1/4"	N-400	4.90	5.85	17.10	20.80
3/8"	N-600	6.70	7.90	22.90	26.60
1/2"	N-800	9.30	9.80	28.80	31.90
3/4"	N-1200	12.95	13.40	39.90	45.60
1"	N-1600	43.00	32.40	94.30	129.60

"C" SERIES MANATROL CHECK VALVES

PIPE SIZE	MODEL NO.	BRASS	STEEL	303 STAIN-LESS STEEL	316 STAIN-LESS STEEL
1/8"	C-200	2.85	3.95	11.00	12.00
1/4"	C-400	4.30	5.20	15.10	17.70
3/8"	C-600	5.35	6.45	18.90	21.70
1/2"	C-800	6.95	7.40	22.00	26.30
3/4"	C-1200	9.25	9.65	28.40	36.70
1"	C-1600	32.00	22.90	65.00	87.40
1 1/4"	C-2000	----------	36.50	----------	----------
1 1/2"	C-2400	----------	65.00	----------	----------
2"	C-3200	----------	77.50	----------	----------

"MV" SERIES MANATROL METERING VALVES

PIPE SIZE	MODEL NO.	STEEL	BRASS	316 STAIN-LESS STEEL
1/8"	MV-200	3.60	3.60	9.80
1/4"	MV-400	3.70	3.70	9.90
3/8"	MV-600	4.30	4.30	11.00
1/2"	MV-800	5.65	5.65	15.40
3/4"	MV-1200	11.20	11.20	36.20
1/8"	MV-201	3.90	3.90	10.20
1/4"	MV-401	4.20	4.20	12.60
3/8"	MV-601	4.80	4.80	13.40
1/2"	MV-801	6.60	6.60	25.60
3/4"	MV-1201	12.30	12.30	38.80
1/8"	MV-230	4.00	4.00	10.20
1/4"	MV-430	4.40	4.40	12.60
3/8"	MV-630	5.00	5.00	13.40
1/2"	MV-830	6.90	6.90	18.10
3/4"	MV-1230	12.80	12.80	38.80
1/8"	MV-231	4.00	4.00	10.20
1/4"	MV-431	4.40	4.40	12.60

PIPE SIZE	MODEL NO.	STEEL	BRASS	316 STAIN-LESS STEEL
1/4"	MV-432	4.40	4.40	12.60
1/8"	MV-260	3.90	3.90	10.90
1/4"	MV-460	4.20	4.20	13.60
3/8"	MV-660	4.80	4.80	15.60
1/2"	MV-860	6.60	6.60	27.00
3/4"	MV-1260	12.30	12.30	38.80
1/8"	MV-261	3.60	3.60	9.80
1/4"	MV-461	3.70	3.70	9.90
3/8"	MV-661	4.30	4.30	12.80
1/2"	MV-861	5.80	5.80	15.40
3/4"	MV-1261	11.20	11.20	36.20
1/8"	MV-265	4.00	4.00	10.20
1/4"	MV-465	4.40	4.40	12.90
3/8"	MV-665	5.00	5.00	13.60
1/2"	MV-865	6.90	6.90	27.00
3/4"	MV-1265	12.80	12.80	38.80

"MVK" SERIES MANATROL METERING VALVE PANEL MOUNTING KITS

VALVE SIZE	MODEL NO.	PRICE EACH
1/8"	MVK-200	.40
1/4"	MVK-400	.40
3/8"	MVK-600	.50
1/2"	MVK-800	.50
3/4"	MVK-1200	.60

This item earns its own quantity discount.

Cannot be combined with other items to determine discount.

"GF" SERIES MANATROL FIXED SNUBBER

PIPE SIZE	MODEL NO.	STEEL	BRASS
1/4"	GF-400	2.90	3.05
1/2"	GF-800	3.30	3.60

PRICE LIST "B"

MANATROL

A Division of Perry-Fay Co.

200 PERRY COURT ELYRIA, OHIO 44035

Phone: 322-4631
Area Code 216

IMPORTANT — VALVES PRICED ON PRICE LIST "B" EARN THEIR OWN DISCOUNT.

Discount Schedule	
1-9	List
10-24	5%
25-49	10%
50-99	15%
100 & Up	20%

Effective Date July 1, 1964

"FS" SERIES MANATROL SUB-PLATE FLOW CONTROL VALVES

PIPE SIZE	MODEL NO.	PRICE EACH STEEL ONLY	MOUNTING SUB-PLATE
1/8"	FS-200	8.80	7.00
1/8"	4FS-200	9.70	7.00
1/4"	FS-400	10.80	8.00
3/8"	FS-600	14.40	9.00
1/2"	FS-800	17.50	10.00
3/4"	FS-1200	24.90	11.00
1"	FS-1600	52.50	12.00
1 1/4"	FS-2000	75.00	15.00

"NS" SERIES MANATROL SUB-PLATE NEEDLE VALVES

PIPE SIZE	MODEL NO.	PRICE EACH STEEL ONLY	MOUNTING SUB-PLATE
1/8"	NS-200	5.90	7.00
1/8"	4NS-200	6.80	7.00
1/4"	NS-400	7.50	8.00
3/8"	NS-600	10.90	9.00
1/2"	NS-800	13.40	10.00
3/4"	NS-1200	19.20	11.00
1"	NS-1600	38.80	12.00

"CS" SERIES MANATROL SUB-PLATE CHECK VALVES

PIPE SIZE	MODEL NO.	PRICE EACH STEEL ONLY	MOUNTING SUB-PLATE
1/8"	CS-200	6.80	7.00
1/4"	CS-400	9.60	8.00
3/8"	CS-600	11.50	9.00
1/2"	CS-800	13.60	10.00
3/4"	CS-1200	19.90	11.00
1"	CS-1600	37.30	12.00
1 1/4"	CS-2000	57.00	15.00

"CP" SERIES MANATROL PILOT OPERATED CHECK VALVES

PIPE SIZE	MODEL NO.	PRICE EACH STEEL ONLY	40:1 POPPET
1/4"	CP. ACP, BACP-400	29.50	5.00
3/8"	CP, ACP, BACP-600	29.50	5.00
1/2"	CP, ACP, BACP-800	46.00	7.00
3/4"	CP, ACP, BACP-1200	46.00	7.00
1"	CP, ACP, BACP-1600	65.00	12.00
1 1/4"	CP, ACP, BACP-2000	95.00	12.00
1 1/2"	CP, ACP, BACP-2400	105.00	12.00

"CPS" SERIES MANATROL SUB-PLATE PILOT OPERATED CHECK VALVES

PIPE SIZE	MODEL NO.	PRICE EACH STEEL ONLY	40:1 POPPET	MOUNTING SUB-PLATE
1/4"	CPS, ACPS, BACPS-400	38.50	5.00	9.00
3/8"	CPS, ACPS, BACPS-600	38.50	5.00	9.00
1/2"	CPS, ACPS, BACPS-800	58.00	7.00	12.00
3/4"	CPS, ACPS, BACPS-1200	58.00	7.00	16.00
1"	CPS, ACPS, BACPS-1600	78.00	12.00	28.00
1 1/4"	CPS, ACPS, BACPS-2000	120.00	12.00	35.00
1 1/2"	CPS, ACPS, BACPS-2400	130.00	12.00	37.00

"CR" SERIES MANATROL CHECK RELIEF VALVES

INTERNALLY ADJUSTABLE

PIPE SIZE	MODEL NO.	STEEL	303 STAINLESS STEEL	316 STAINLESS STEEL
1/4"	CR-400	8.40	27.20	35.60
3/8"	CR-600	10.20	32.60	43.00
1/2"	CR-800	12.30	40.00	51.60
3/4"	CR-1200	15.00	49.50	63.00
1"	CR-1600	26.90	86.00	113.00
1 1/4"	CR-2000	41.30	135.00	173.50

"CRS" SERIES MANATROL SUB-PLATE CHECK RELIEF VALVES

INTERNALLY ADJUSTABLE

PIPE SIZE	MODEL NO.	PRICE EACH STEEL ONLY	MOUNTING SUB-PLATE
1/4"	CRS-400	10.00	8.00
3/8"	CRS-600	12.20	9.00
1/2"	CRS-800	14.40	10.00
3/4"	CRS-1200	20.90	11.00
1"	CRS-1600	37.40	12.00
1 1/4"	CRS-2000	58.50	15.00

"ECR" SERIES MANATROL CHECK RELIEF VALVES

EXTERNALLY ADJUSTABLE

PIPE SIZE	MODEL NO.	STEEL	303 STAINLESS STEEL	316 STAINLESS STEEL
1/4"	ECR-400	9.70	31.00	40.90
3/8"	ECR-600	11.60	37.10	48.80
1/2"	ECR-800	14.10	45.00	59.50
3/4"	ECR-1200	17.60	56.50	74.00
1"	ECR-1600	29.70	95.00	124.50
1 1/4"	ECR-2000	44.40	142.00	186.50

"ECRS" SERIES MANATROL CHECK RELIEF VALVES

EXTERNALLY ADJUSTABLE

PIPE SIZE	MODEL NO.	PRICE EACH STEEL ONLY	MOUNTING SUB-PLATE
1/4"	ECRS-400	10.90	8.00
3/8"	ECRS-600	12.90	9.00
1/2"	ECRS-800	15.40	10.00
3/4"	ECRS-1200	22.50	11.00
1"	ECRS-1600	40.00	12.00
1 1/4"	ECRS-2000	60.00	15.00

"RA" SERIES MANATROL RELIEF VALVES

PIPE SIZE	MODEL NO.	PRICE EACH STEEL ONLY	MOUNTING SUB-PLATE
1/4"	RA-400	14.80	16.40
3/8"	RA-600	16.50	18.20
1/2"	RA-800	21.90	24.40
3/4"	RA-1200	24.00	26.80

"RAS" SERIES MANATROL SUB-PLATE RELIEF VALVES

PIPE SIZE	MODEL NO.	PRICE EACH STEEL ONLY	MOUNTING SUB-PLATE
1/4"	RAS-400	16.90	9.00
3/8"	RAS-600	16.90	9.00
1/2"	RAS-800	28.00	11.00
3/4"	RAS-1200	28.00	11.00

"TPC" SERIES MANATROL FLOW CONTROL VALVES

PIPE SIZE	MODEL NO.	FLOW RATE DESIGNATION						MOUNTING SUB-PLATE
		–01	–02	–06	–3	–6	–25	
3/8"	TPC-600	59.00	59.00	54.00	54.00	54.00	----------	--------
3/4"	TPC-1200	--------	--------	--------	--------	--------	87.00	--------
3/8"	TPCS-600	62.50	62.50	57.50	57.50	57.50	----------	13.00
3/4"	TPCS-1200	--------	--------	--------	--------	--------	117.00	25.00
3/8"	TPCC-600	64.00	64.00	59.00	59.00	59.00	----------	--------
3/4"	TPCC-1200	--------	--------	--------	--------	--------	114.00	--------
3/8"	TPCCS-600	67.50	67.50	62.50	62.50	62.50	----------	13.00
3/4"	TPCCS-1200	----------	--------	--------	--------	--------	124.00	30.00

"GT" SERIES MANATROL PUSH-TO-READ VALVES

PIPE SIZE	MODEL NO.	PRICE EACH STEEL ONLY
1/4"	GT-400	13.90

SERIES MANATROL FLOW CONTROL VALVES

"PCAF"

PIPE SIZE	MODEL NO.	PRICE EACH STEEL ONLY
1/4"	PCAF-400	12.60
3/8"	PCAF-600	14.90
1/2"	PCAF-800	18.60
3/4"	PCAF-1200	26.00
1"	PCAF-1600	36.40
1 1/4"	PCAF-2000	130.00

"PCFF"

SIZE PIPE	NO. MODEL	STEEL ONLY PRICE EACH
1/4"	PCFF-400	8.20
3/8"	PCFF-600	8.50
1/2"	PCFF-800	11.30
3/4"	PCFF-1200	15.00
1"	PCFF-1600	22.60
1 1/4"	PCFF-2000	91.50

"MVBF" SERIES MANATROL BALANCED THROTTLING VALVES

PIPE SIZE	MODEL NO.	DUCTILE IRON FLNG. MTG.	PAIR MATING FLANGES
1"	MVBF-1600	58.00	20.00
1 1/2"	MVBF-2400	95.00	28.00
2"	MVBF-3200	130.00	36.00

"G" SERIES MANATROL ADJUSTABLE SNUBBER

PIPE SIZE	MODEL NO.	STEEL	BRASS
1/4"	G-400	6.50	6.50
1/2"	G-800	7.50	7.50

"D & DS" SERIES MANATROL CAM OPERATED TWO WAY

PIPE SIZE	MODEL NO.	PRICE EACH STEEL ONLY	MOUNTING SUB-PLATE
3/8"	D-600	26.00	----------
3/8"	DS-600	32.80	13.00

MANATROL CONTROL PANELS

PIPE SIZE	MODEL NO.	PRICE EACH STEEL ONLY	FLOW RATE DESIGNATION				
			—01	—02	—06	—3	—6
3/8"	DSB-600	45.80	----------	----------	----------	----------	----------
3/8"	TPCCDSB4-600	----------	162.20	162.20	157.20	157.20	157.20
3/8"	DCSB-600	77.70	----------	----------	----------	----------	----------
3/8"	TPCCDSB-600	----------	145.20	145.20	140.20	140.20	140.20
3/8"	DFSB-600	83.70	----------	----------	----------	----------	----------
3/8"	TPCDSB-600	----------	122.30	122.30	117.30	117.30	117.30